APPLICATION

TRANSMISSION APPLICATION

Application	Transaxle Model
New Beetle	01M, 4-Speed

IDENTIFICATION

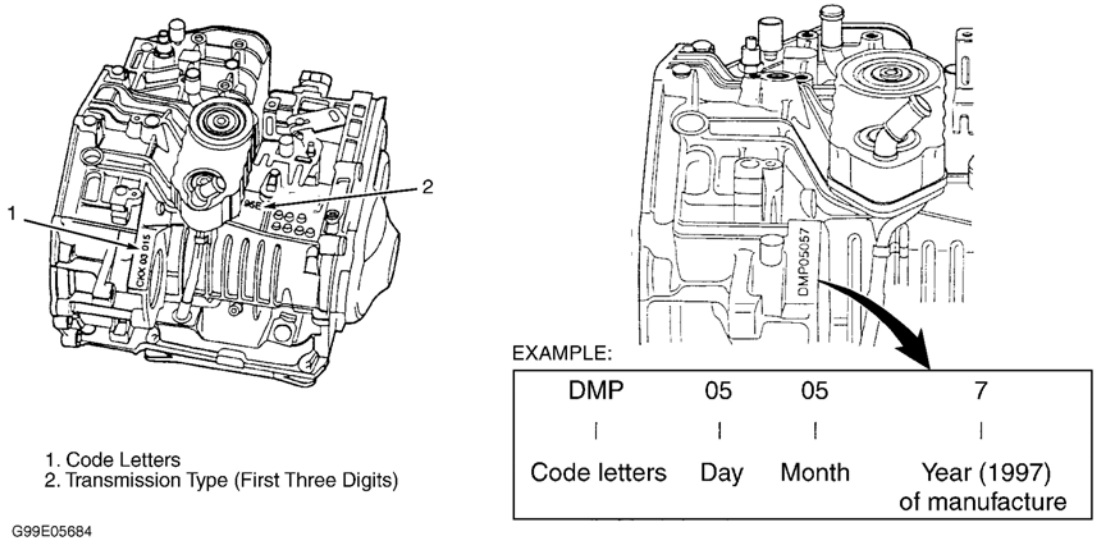


Fig. 1: Identification Of Transmission Type & Code Letters (01M Transaxle)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

ON BOARD DIAGNOSTIC (OBD), FUNCTION

Automatic transmission is controlled electro-hydraulically. On Board Diagnostic (OBD) refers specifically to the electronic/electric controls of the automatic transmission.

SPECIFIC FUNCTIONS

Transmission Control Module (TCM) -J217- With Adaptive Gear Shift Points (Fuzzy Logic)

The transmission control module determines the driving dependent gear shift points automatically. Advantages:

- Gear shifts will be directed toward optimum fuel consumption.
- Maximum engine output is always available.

- Individual adaptation of gear shift points in all driving situations.
- Gear shift points are infinitely variable.

Shift Point Variations For Hills

An additional gear shift map automatically selects shifts for hills dependent upon accelerator pedal position and driving speed.

- Gear shift map for extreme uphill stretches is matched to engine output.
- Gear shift map for extreme downhill stretches is matched to the braking effect of the engine.

Safety Functions Of The Transmission Control Module (TCM) -J217-

TCM -J217- receives information from components that effect the selection of gears and passes information on to solenoid valves in valve body.

Control module is equipped with a Diagnostic Trouble Code (DTC) memory so that in event of an electronic/electrical component malfunction or an open circuit location can be determined quickly. Malfunctions are recognized by electrical signals and stored in the DTC memory.

If malfunctions occur in the monitored sensors or components, these are stored in DTC memory together with an indication of the type of malfunction. Malfunctions which only occur once are known as sporadic (temporary) malfunctions and are identified as such.

If malfunctions do not reoccur within a minimum of 5 km (3 miles) or 6 minutes or a maximum of 20 km (12 miles) or 24 minutes, they are stored as sporadic malfunctions. Electrical malfunctions that affect vehicle performance can be determined with the VAG 1551 Scan Tool. The diagnostic possibilities can only be fully exploited with operating mode 1, "Rapid data transfer", of the VAG 1551 Scan Tool.

For a list of functions which the VAG 1551 Scan Tool can register, see **DIAGNOSTIC TROUBLE CODE (DTC) TABLE** .

Emergency Running Mode

If critical malfunctions occur when driving, the transmission will continue to operate, but in an emergency running mode. If the malfunction occurs in "D", "3" or "2", then 3rd gear emergency running mode is activated. If the malfunction occurs in "1", "P", "N" or "R" then the emergency running mode for that stage is activated.

If the engine is started again in the emergency running mode and the malfunction occurs when the selector lever is in position "D", "3" or "2" then 3rd gear is activated hydraulically, until the malfunction is corrected.

For all malfunctions which can lead to the emergency running mode, the transmission will remain in this mode until the malfunction is no longer recognized by the control module over a predetermined period.

Malfunctions Which May Lead To Emergency Running

- Open circuit in wiring
- Short circuit in wiring
- Wiring open circuit and/or CAN-Bus wiring short circuit
- Electrical or hydraulic components faulty

TCM -J217- Malfunction Recognition

Sporadic malfunctions are stored in the memory and displayed as "sporadic" when retrieved by the VAG 1551 Scan Tool. "SP" appears on the right of the display in such cases. If the printer is switched on, "sporadic malfunctions" are printed out after the DTC memory is addressed.

If a malfunction exists it is stored as a static malfunction. If the malfunction no longer exists after a predetermined period or distance travelled, it is considered a sporadic malfunction.

Malfunctions which are stored in the memory as sporadically occurring malfunctions are automatically erased after 1,000 km (625 miles) or 20 hours.

The information exchange between vehicle control modules is conducted by "CAN-Bus". The advantages of the "CAN-Bus" are a very rapid data transfer and less wiring in the vehicle.

Faulty CAN-Bus wiring, e.g. open circuits, can be directly detected as such by the control module. The exact location of the malfunction cannot be determined, however, until all control module DTC memories have been checked.

VAG 1551 Scan Tool

From July 1997 a further number on the right next to the DTC code will be displayed/printed-out when checking the DTC memory (with up-to-date program card version of VAG 1551). This number indicates the type of malfunction, which is also given again in text under the affected component on the VAG 1551 display.

ON BOARD DIAGNOSTIC (OBD), TECHNICAL DATA

On Board Diagnostic (OBD), technical data

Memory	
♦ Permanent memory	yes
Data output ♦ Rapid data transfer	 yes
Data transfer between the control modules via: ♦ CAN-Bus	 yes
Output Diagnostic Test Mode (DTM)	no
Basic setting	yes
Coding control module	no
Reading measured value block	yes
Electric/electronic components and locations	See ELECTRICAL/ ELECTRONIC COMPONENTS

G00385559

Fig. 2: On Board Diagnostic Technical Data
Courtesy of VOLKSWAGEN UNITED STATES, INC.

DIAGNOSTIC GUIDE

Troubleshooting With VAG 1551 Scan Tool

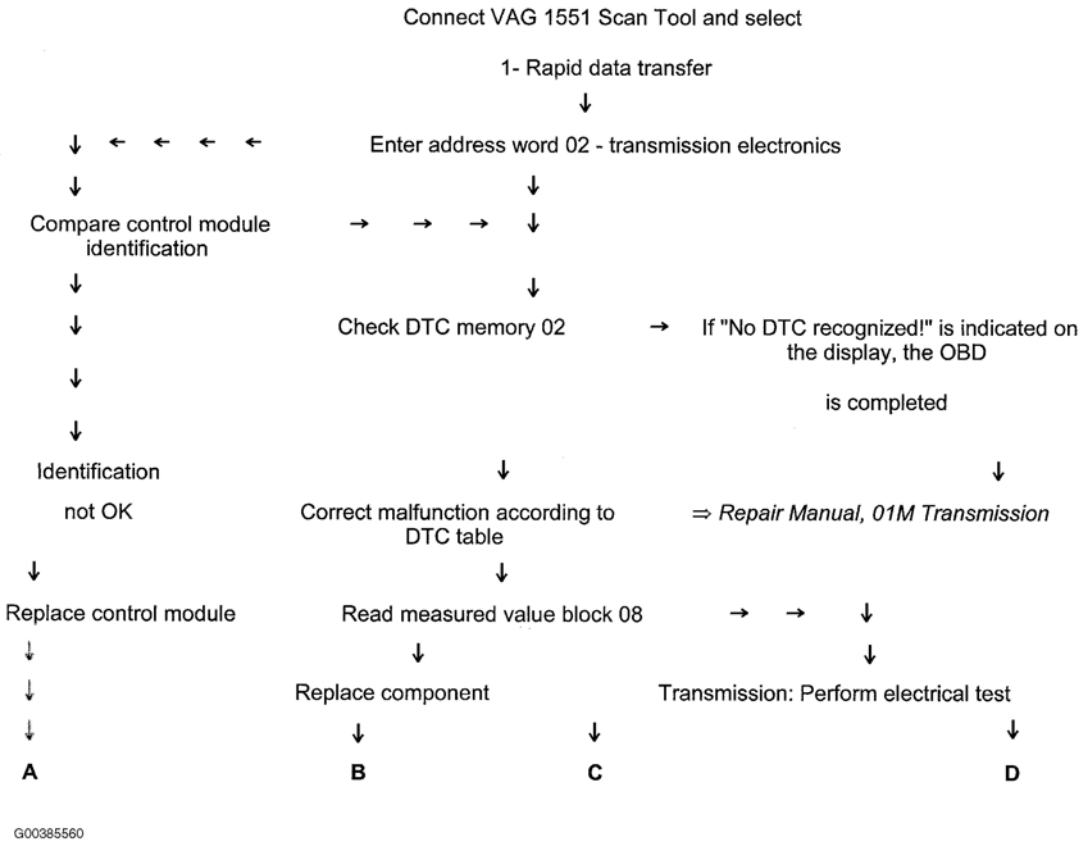


Fig. 3: Troubleshooting With VAG 1551 Scan Tool (1 Of 2)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

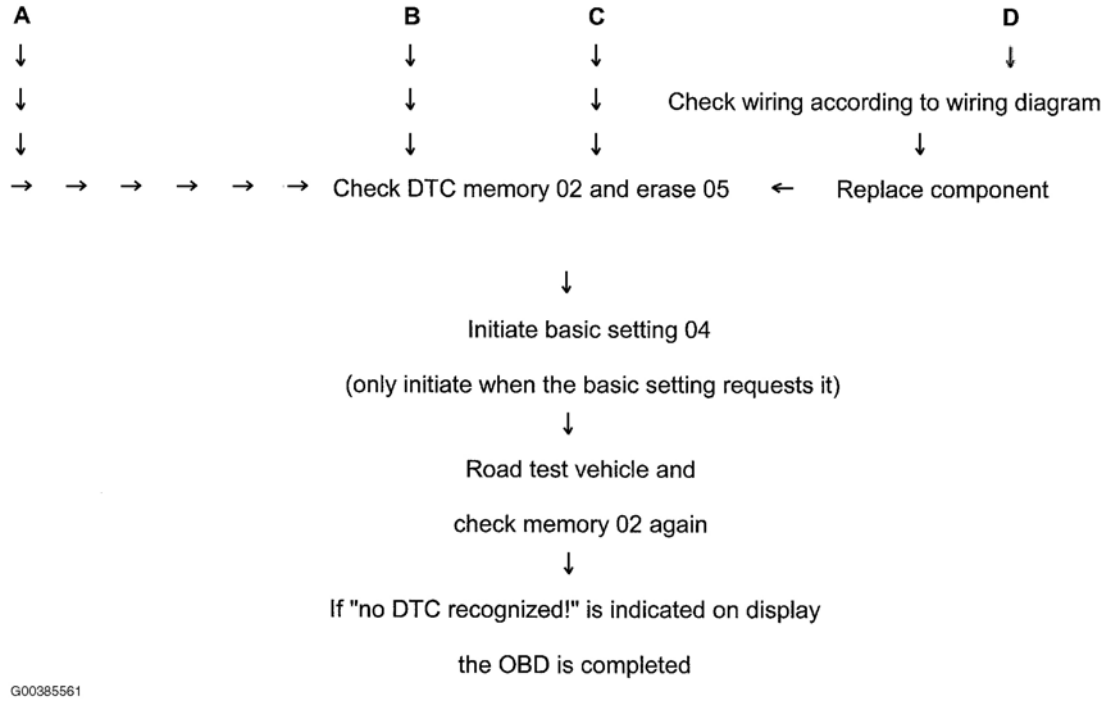


Fig. 4: Troubleshooting With VAG 1551 Scan Tool (2 Of 2)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

ELECTRICAL/ELECTRONIC COMPONENTS

BATTERY DISCONNECTING & RECONNECTING

CAUTION: Before beginning repairs on the electrical system:

- **Obtain anti-theft radio security code.**
- **Switch off all electrical consumers.**
- **Switch ignition off and remove ignition key.**
- **Do not loosen or remove ground strap from body. Disconnect terminal from battery only.**

For work steps required after reconnecting battery, see **Fig. 5** .

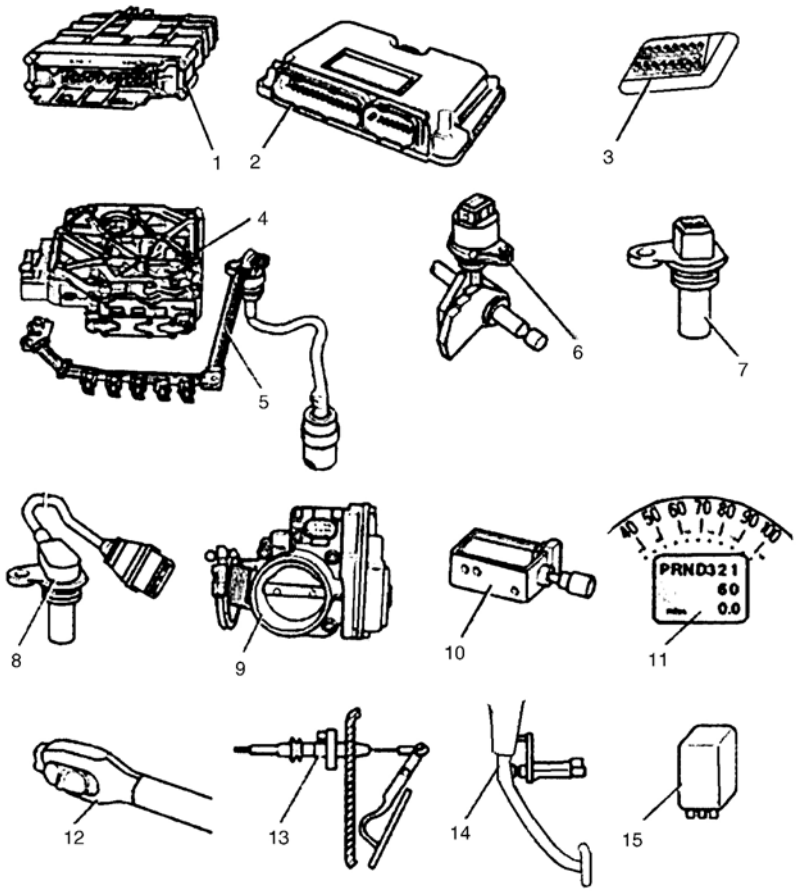
Work steps	completed?
Diagnostic Trouble Code (DTC) Memory: Check using VAS 5051 Tester in mode "Guided Fault Finding".	
Power windows (where applicable): Completely open and close all power windows.	
Radio: Input anti-theft radio code and check radio, CD & tape player functions as applicable.	
Clock: Check and reset to local time.	
All electrical consumers: Check function.	

G00387816

Fig. 5: Reconnecting Battery Work Steps
Courtesy of VOLKSWAGEN UNITED STATES, INC.

NOTE: **If desired, print this page and use the table above as a checklist.**

COMPONENT IDENTIFICATION



1 - Transmission Control Module -J217-

- tighten nut for ground wire (located left of TCM) to 9 ± 1 Nm (80 ± in. lb)

2 - Engine Control Module

Note:

If engine or transmission control modules are replaced, the system must be returned to basic setting, Initiating basic setting.

3 - Data Link Connector (DLC)

4 - Valve body

- The solenoid valves -N88-, -N89-, -N90- , -N91-, -N92-, -N93- and -N94- are attached to the valve body
- The valves are checked by On Board Diagnostic (OBD)

5 - Conductor strip with integrated Transmission Fluid Temperature Sensor -G93-

- -G93- is checked by On Board Diagnostic (OBD)

6 - Multi-Function Transmission Range (TR) Switch -F125-

- -F125- is checked by On Board Diagnostic (OBD)

7 - Transmission Vehicle Speed (VSS) Sensor -G38-

- -G38- is checked by On Board Diagnostic (OBD)

8 - Vehicle Speed Sensor (VSS) -G68-

- -G68- is checked by On Board Diagnostic (OBD)

9 - Throttle Position (TP) Sensor -G69-

- Signal of -G69- is checked by On Board Diagnostic (OBD)

10 - Shift Lock Solenoid -N110-

- The solenoid is checked by On Board Diagnostic (OBD)
- Can be checked electrically and via reading measured value block

11 - Transmission Range (TR) Selector Lever Display -Y5-

12 - Cruise Control Switch -E45-

- Can be checked via reading measured value block

13 - Kick Down Switch -F8-

- Can be checked electrically and via reading measured value block

14 - Brake Light Switch -F-

- Location, removing and installing
- Can be checked electrically and via reading measured value

15 - Park/Neutral Position (PNP) Relay - J226-

G00385562

Fig. 6: Identifying Electrical/Electronic Components
Courtesy of VOLKSWAGEN UNITED STATES, INC.

COMPONENT LOCATION

Engine Control Module

Location: plenum chamber under windshield.

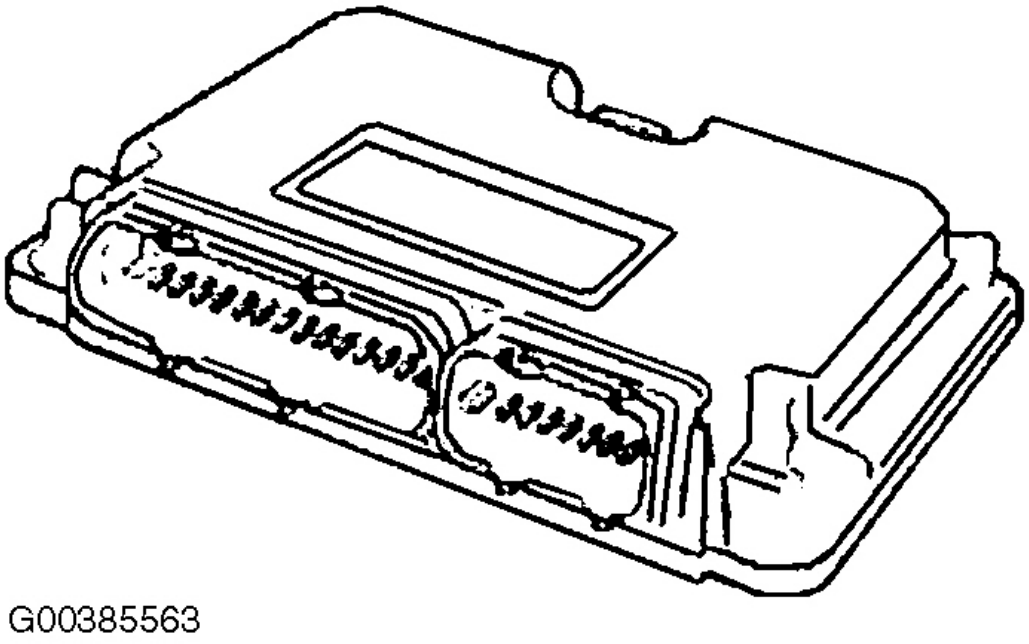


Fig. 7: Identifying Engine Control Module
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Removal & Installation

First, check control module identification of the previous Engine Control Module (ECM) as follows:

- Connect diagnostic tester. See **VAG 1551 SCAN TOOL, CONNECTING AND SELECTING FUNCTIONS** .
- Switch ignition on.
- Under address word 33, select "Diagnostic mode 9: vehicle information".
- Select the vehicle information "Test-ID 04: Calibration Identification". Control module identification will be indicated (e.g.: 06A906032KC 4795).
- End diagnosis and switch ignition off.

1. Remove inner cover, left plenum chamber, to do this, slide center cover -1- of plenum chamber forward

out of catch and remove from instrument panel. See **Fig. 8** .

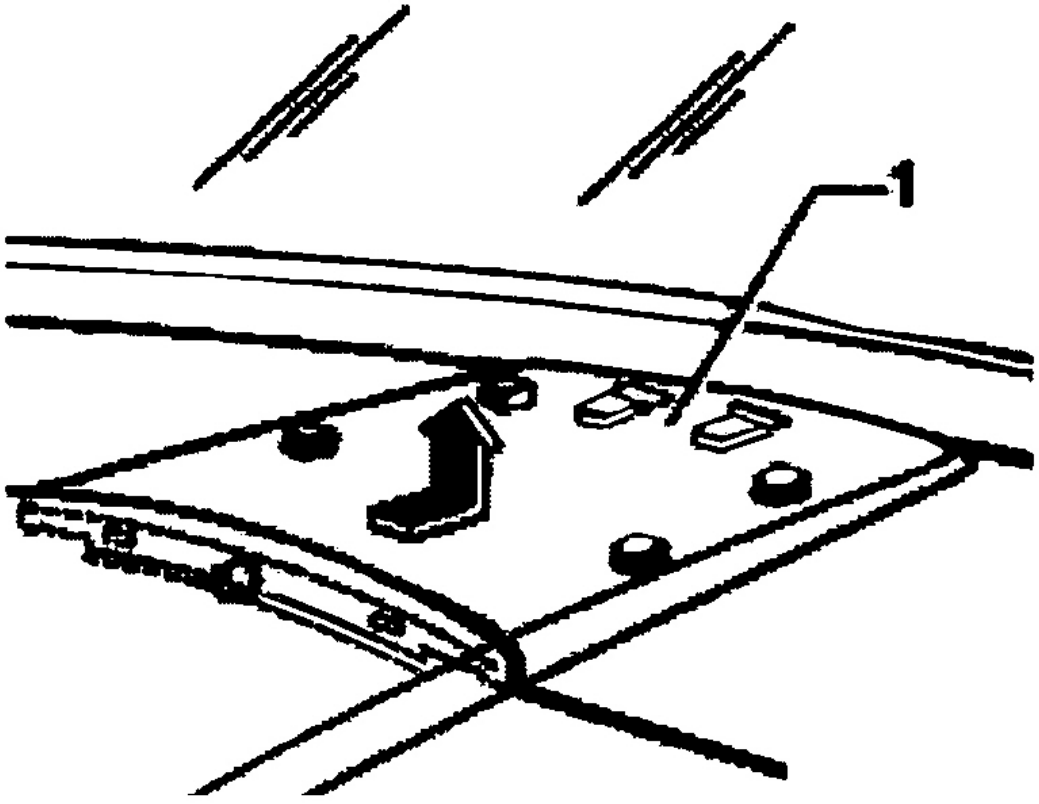


Fig. 8: Removing Dash Panel
Courtesy of VOLKSWAGEN UNITED STATES, INC.

2. Remove three bolts -1-. See **Fig. 9** .

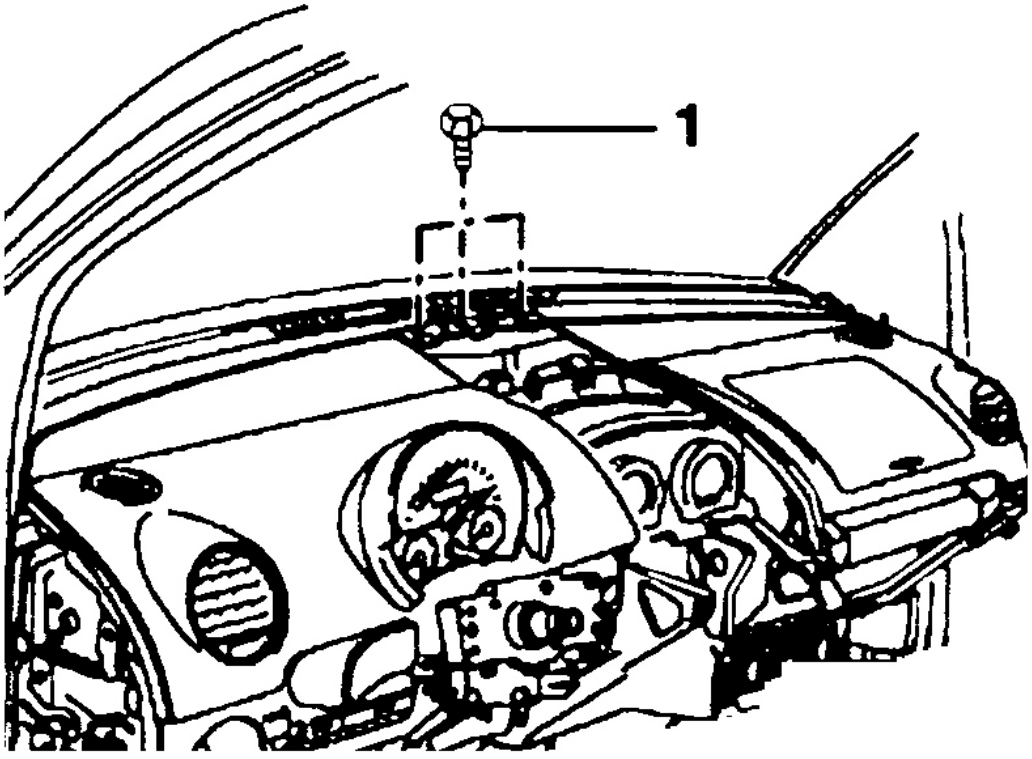
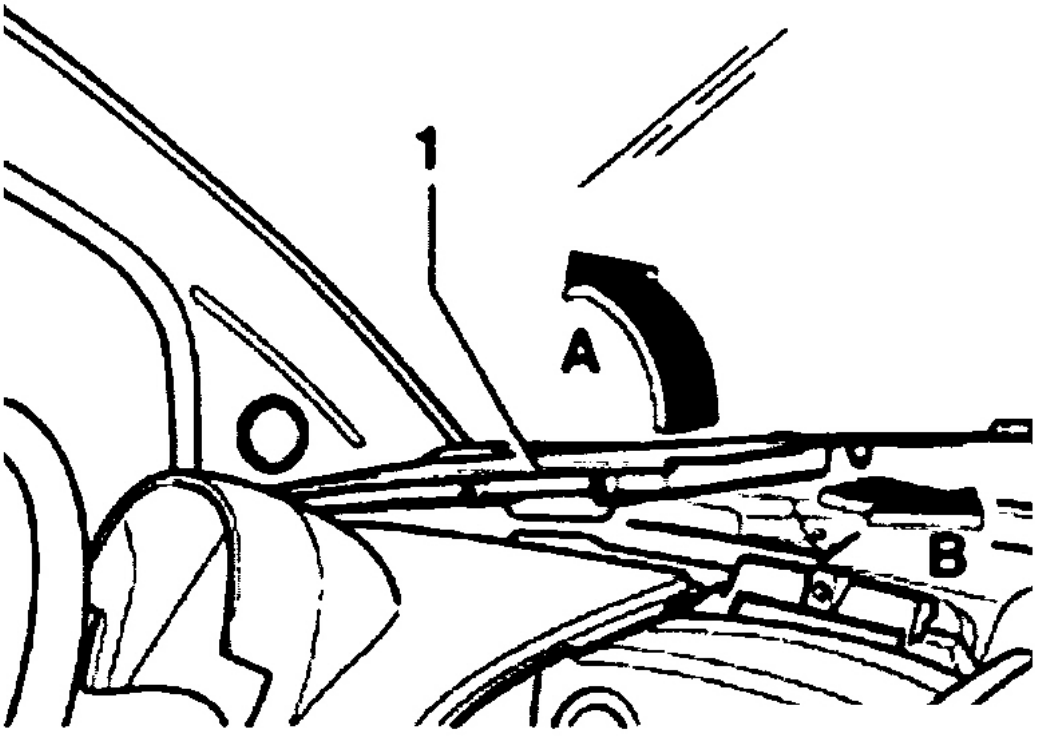


Fig. 9: Locating Plenum Cover Center Mounting Bolts
Courtesy of VOLKSWAGEN UNITED STATES, INC.

3. Lift left cover -1- of plenum chamber in center of instrument panel (arrow A) and thereby unclip (front edge clips, back edge clamps). See **Fig. 10** .



G00385583

Fig. 10: Removing Left Plenum Chamber Cover
Courtesy of VOLKSWAGEN UNITED STATES, INC.

4. Pull cover -1- toward vehicle center out of bracket underneath A-pillar (arrow B).
5. Carefully press back mounting bracket (arrow). See **Fig. 11** .

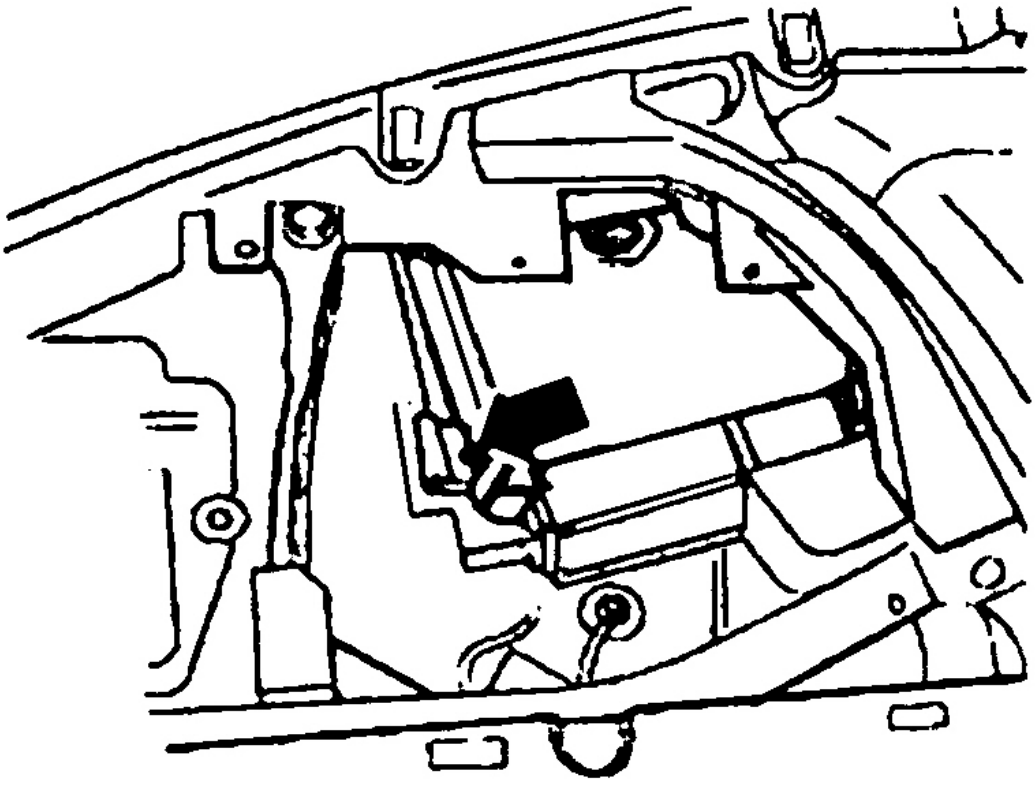


Fig. 11: Removing Engine Control Module
Courtesy of VOLKSWAGEN UNITED STATES, INC.

6. Disengage connector from control module and then disconnect it.
7. Pull control module out of mounting frame.
8. Installation is the reverse of removal, noting the following:
    - Check whether the new control module identification matches the old control module identification.
    - Generate readiness code. See appropriate SELF-DIAGNOSTIC article in ENGINE PERFORMANCE.

Data Link Connector (DLC)

Location: Left of steering column.

NOTE: DLC may be found in center console on some vehicles.

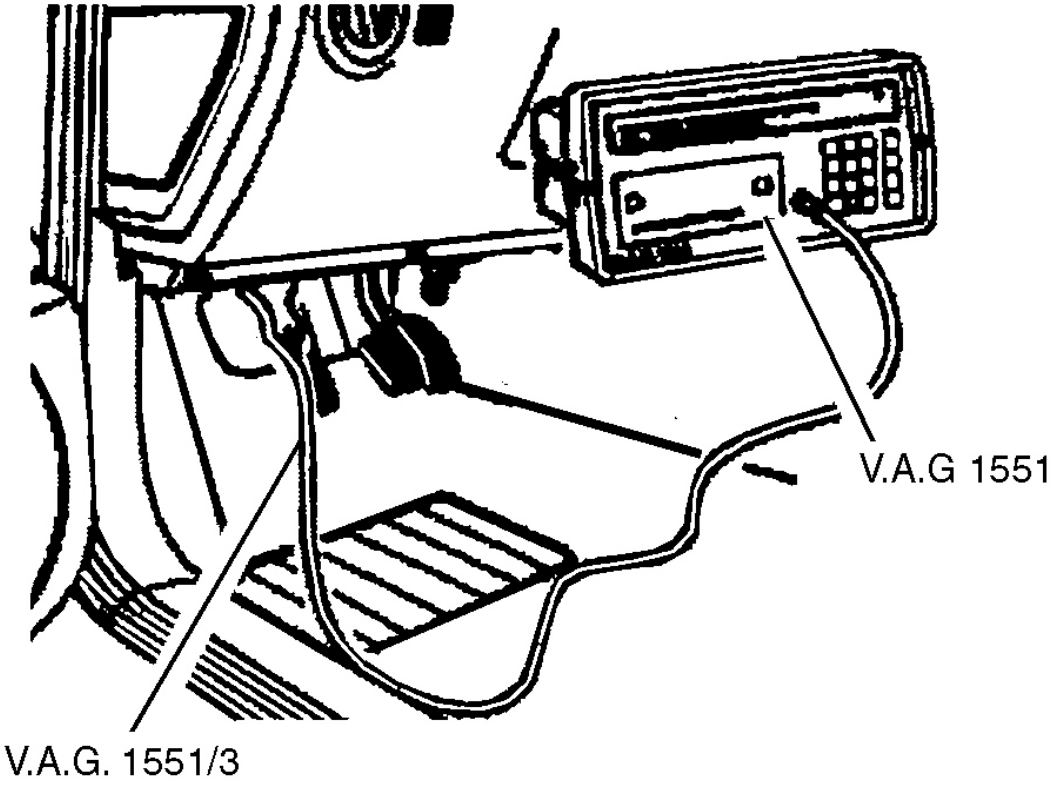
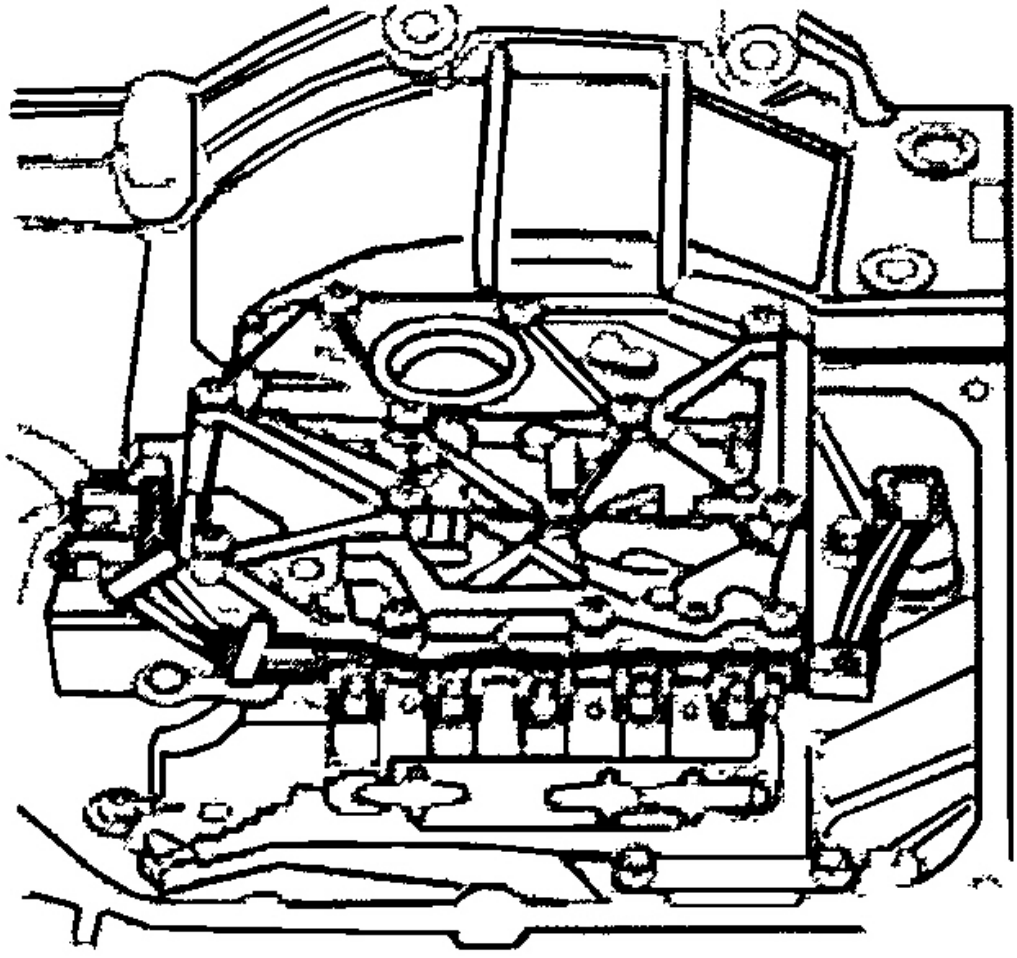


Fig. 12: Locating Data Link Connector
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Valve Body

Location: above oil pan

Solenoid valves -N88-, -N89-, -N90-, -N91-, -N92-, -N93- and -N94- are attached to the valve body.



G00385565

Fig. 13: Identifying Valve Body
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Removal & Installation

For removal and installation procedures, see **SERVICING - A/T (01M)** article.

Conductor Strip With Integrated Transmission Fluid Temperature Sensor -G93-

Location: in oil pan on valve body. See **Fig. 13** .

Removal & Installation

CAUTION: If the locating points are damaged the valve body must be replaced.

NOTE: Do not kink or damage conductor strip.

The conductor strip can be replaced with the transmission installed and without removing the valve body.

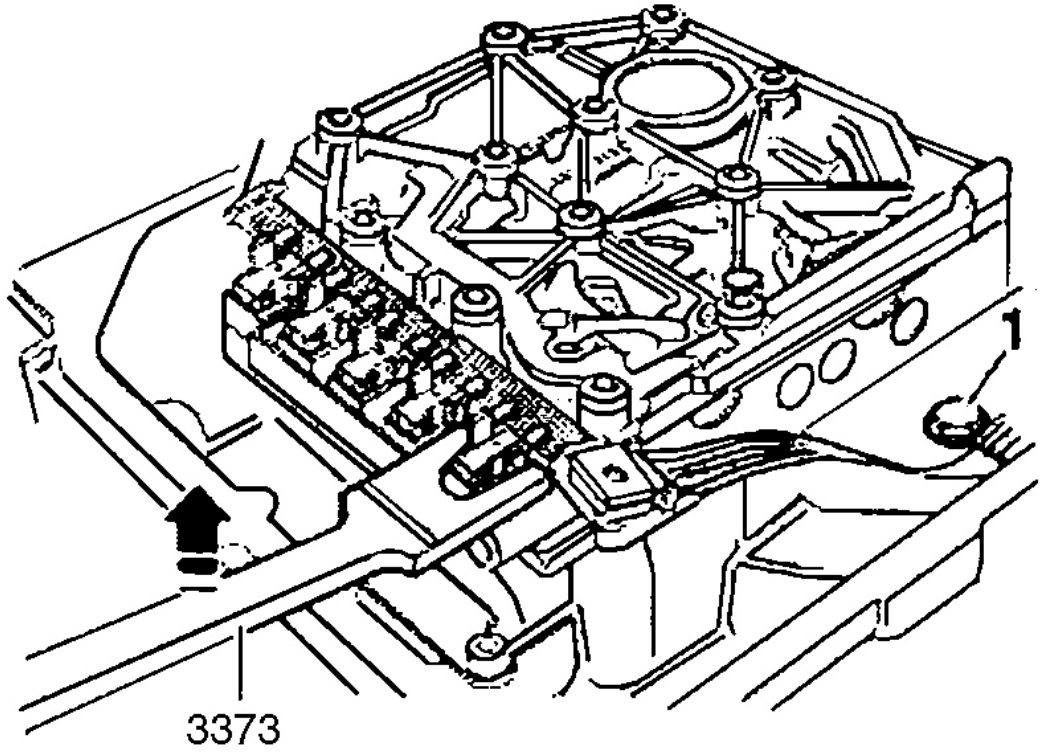


Fig. 14: Removing & Installing Conductor Strip
Courtesy of AUDI OF AMERICA, INC.

1. Separate connector at transmission and remove retaining clamp.
2. Drain ATF.
3. Remove transmission oil pan and remove wiring guide.
4. Pry conductor strip off solenoid valve in direction of arrow with special tool 3373.

5. Installation is performed in the reverse order.
6. For ATF refill procedure, see **SERVICING - A/T (01M)** article.

Multi-Function Transmission Range (TR) Switch -F125-

Location: on rear of transmission

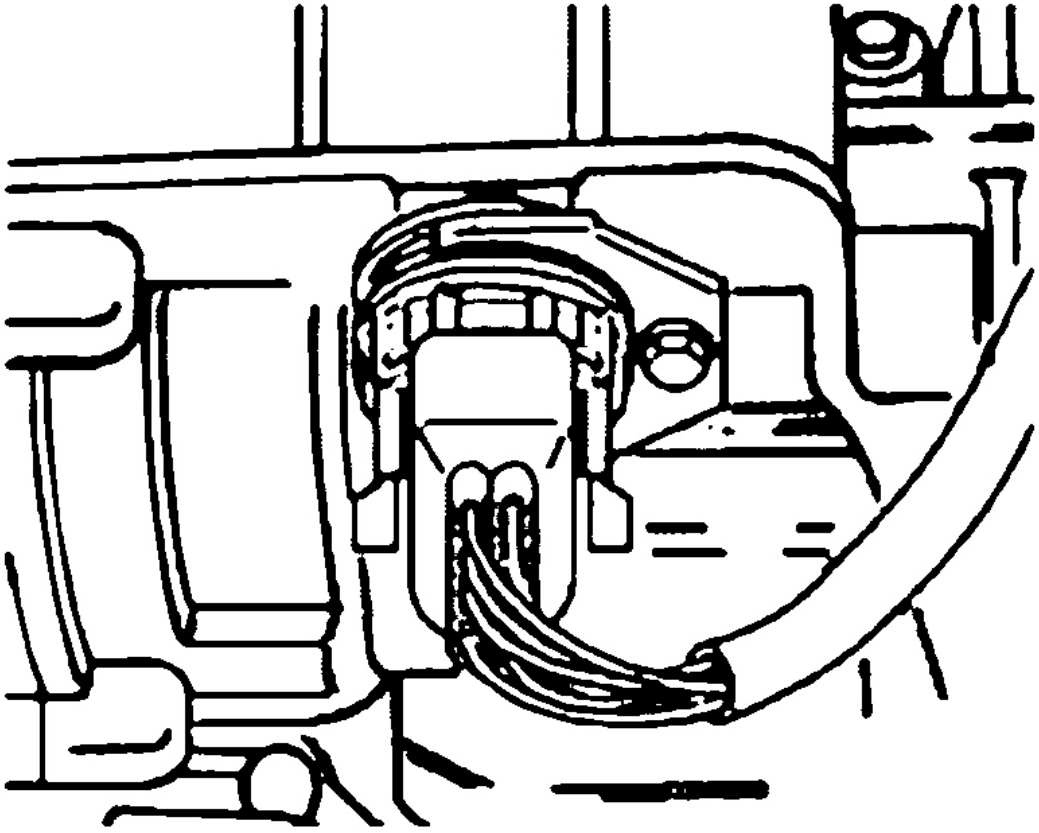


Fig. 15: Identifying Multi-Function Transmission Range
Courtesy of AUDI OF AMERICA, INC.

Removal & Installation

1. Switch off ignition.
2. Pull connector off multi-function TR switch.
3. Remove bolt and retainer.
4. Remove multi-function TR switch.

5. Replace seal.
6. Installation is performed in the reverse order.
7. Tighten bolt to 10 Nm (7 ft lb).

Transmission Range (TR) Selector Lever Display -Y5-

Location: in instrument cluster

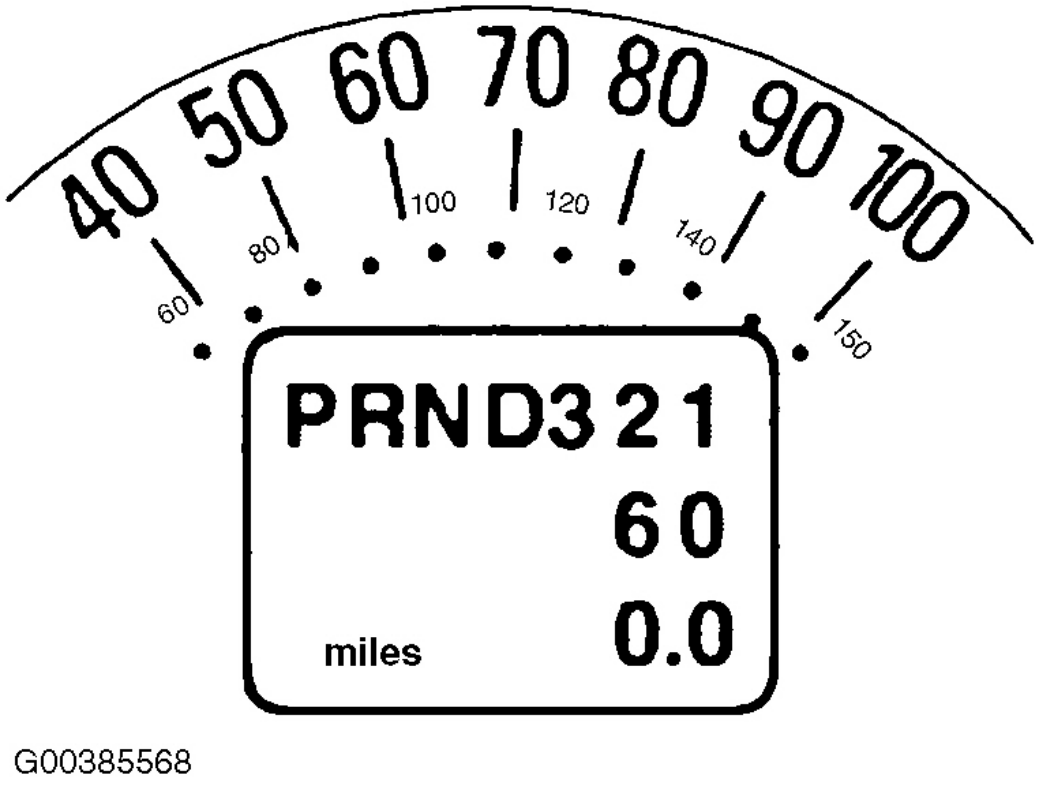


Fig. 16: Identifying Transmission Range Selector Lever
Courtesy of VOLKSWAGEN UNITED STATES, INC.

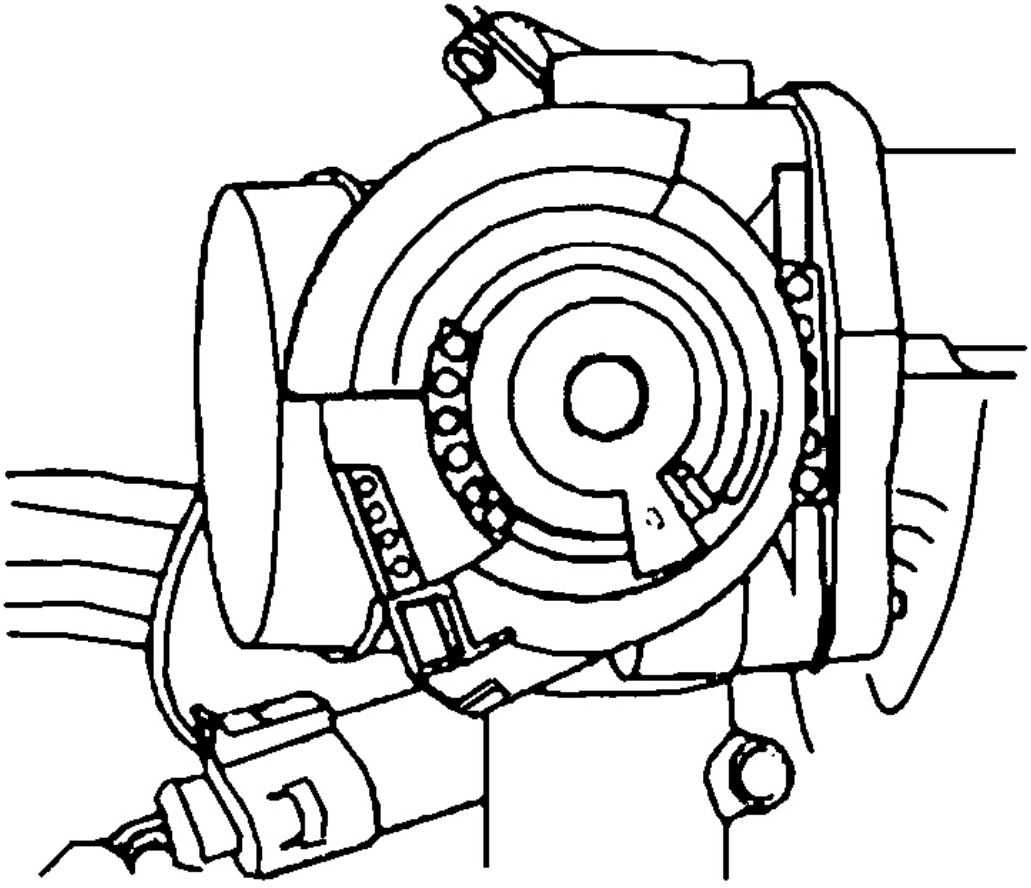
Removal & Installation

For selector lever display removal and installation, see appropriate GAUGES & INSTRUMENT PANEL article in ACCESSORIES & EQUIPMENT.

Throttle Position (TP) Sensor -G69-

Locations:

- On gasoline engines the TP sensor is a component part of the Throttle Valve Control Module -J338- located on the throttle valve housing (engine).
- On Diesel engines the "throttle valve signal" is generated in the Throttle Position (TP) Sensor -G79- located near the accelerator pedal.



G00385569

Fig. 17: Identifying Throttle Position Sensor
Courtesy of VOLKSWAGEN UNITED STATES, INC.

NOTE: Always check the engine OBD when the transmission OBD indicates that the TP sensor is faulty.

For On Board Diagnostic (OBD): The TP sensor is an engine control module sensor. However, the transmission control module also requires the TP signal. On vehicles with CAN-Bus, the automatic transmission control

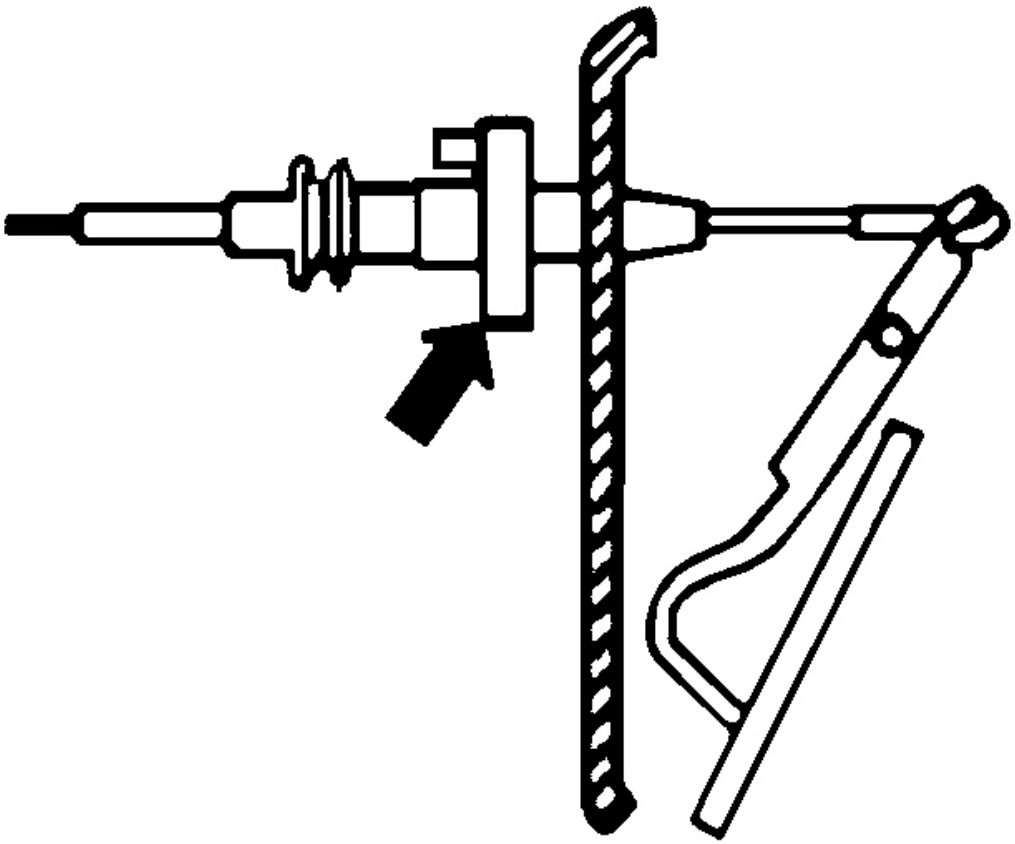
module receives the TP signal from the CAN-Bus.

The On Board Diagnostic (OBD) of the automatic transmission only checks the signal, not the sensor. On vehicles without CAN-Bus, the wire for the signal is also checked. The signal can only be read in the Measured Value Block.

Kickdown Switch -F8-

Locations: Integrated into accelerator cable and is located on bulkhead in engine compartment. On vehicles which do not have an accelerator cable the kickdown signal is generated in the Throttle Position (TP) Sensor -G79- located near the accelerator pedal.

For On Board Diagnostic (OBD): On vehicles without an accelerator cable, the kickdown switch signal is transmitted from the engine control module to the transmission control module.

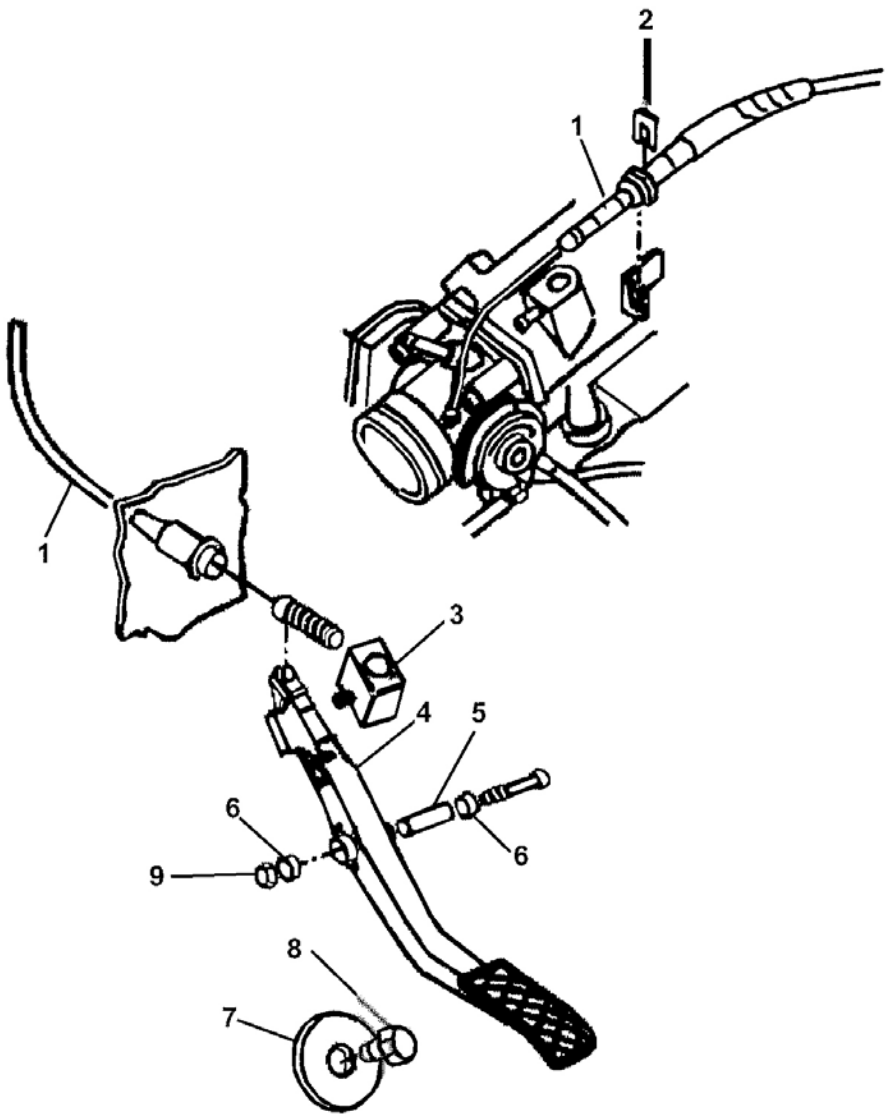


G00385570

Fig. 18: Identifying Kickdown Switch
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Removing & Installing (2.0L, Engine Code AEG)

The accelerator cable must be removed to be able to remove and install the kick down switch. Readjust the cable after installing the switch.



Engine code AEG

1 - Accelerator cable
- Do not reuse damaged accelerator cable, replace

2 - Retaining clip
3 - Vibration damper
4 - Accelerator pedal
5 - Spacer sleeve
6 - Bearing socket
7 - Washer
8 - Stop bolt
9 - 20 Nm

G00385571

Fig. 19: Identifying Accelerator Mechanism Components
Courtesy of VOLKSWAGEN UNITED STATES, INC.

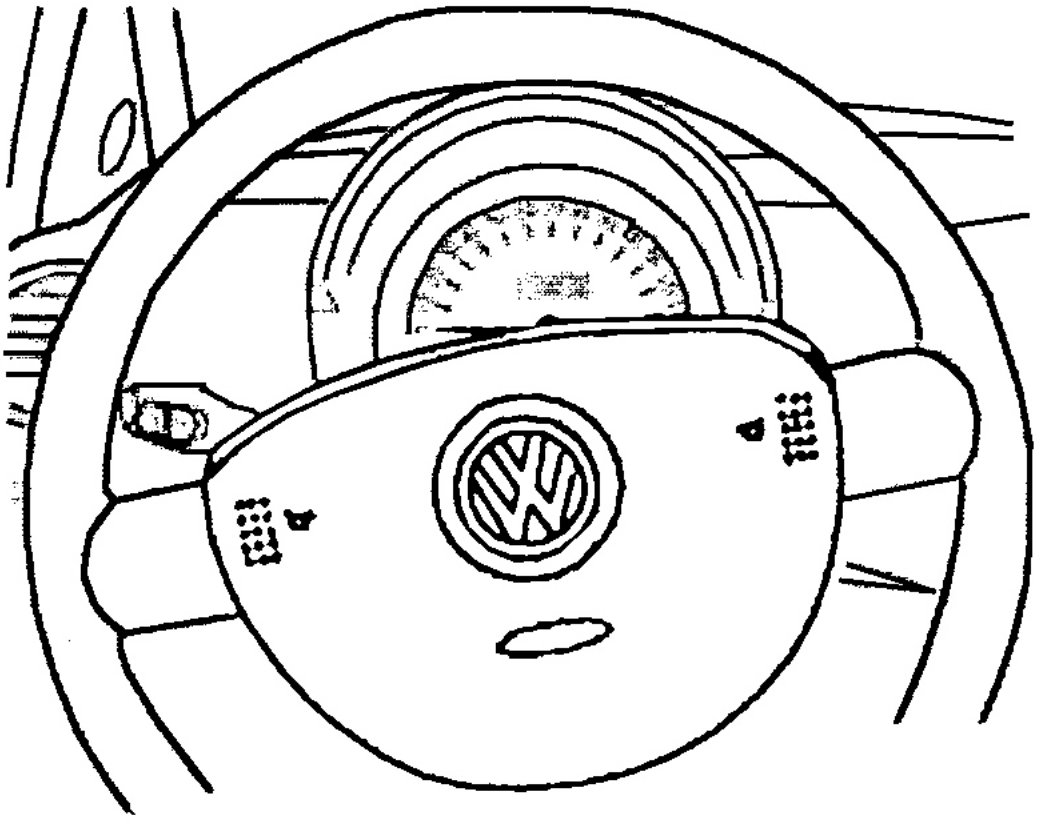
1. Adjust accelerator cable by moving retainer on support bracket so that wide open throttle position is

attained on cam plate of throttle valve control module.

2. Release accelerator pedal.
3. Pull 2-pin connector off Kick down switch -F8- in front engine compartment (on bulkhead).
4. Connect hand multimeter V.A.G. 1526 A with auxiliary cables from V.A.G 1594 to kick down switch.
5. Measure resistance at switch. Specification: infinite resistance.
6. Press accelerator pedal slowly to floor. Shortly after kick down switch point resistance must drop at 0 ohms. Accelerator pedal must be at point just before limit stop.
7. Adjust accelerator cable by moving retainer on support bracket, so that throttle valve is fully open and kick-down switch clicks audibly.
8. Release accelerator pedal or remove speed regulator.
9. Once adjustments are complete check idling and wide open throttle limit stops on throttle valve.

Cruise Control Switch -E45-

Location: on steering column switch.



G00385572

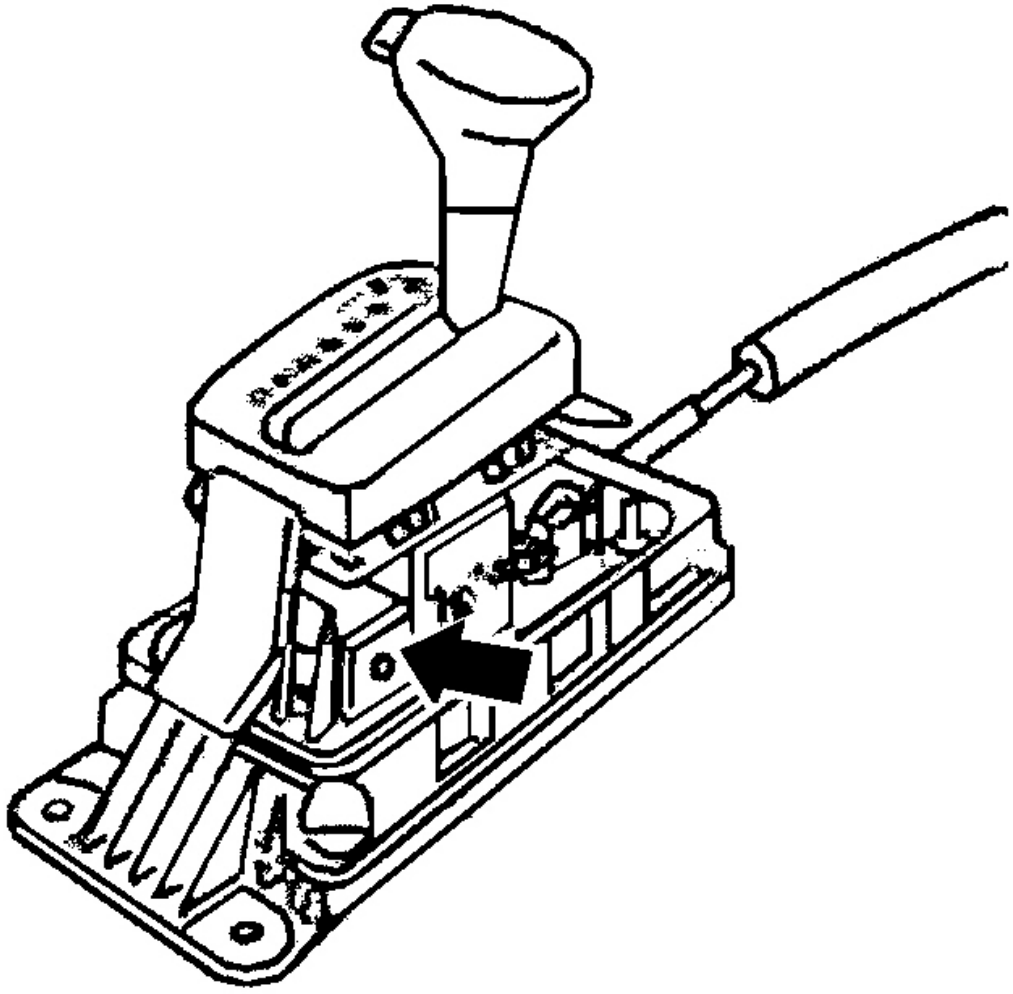
Fig. 20: Identifying Cruise Control Switch
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Removal & Installation

For removal and installation procedures, see appropriate STEERING COLUMN SWITCHES article in ACCESSORIES AND EQUIPMENT.

Shift Lock Solenoid -N110-

Location: in the selector lever housing.



G00385573

Fig. 21: Identifying Shift Lock Solenoid
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Removal & Installation

For removal and installation procedures, see **SERVICING - A/T (01M)** article.

Brake Light Switch

Location: on pedal cluster.

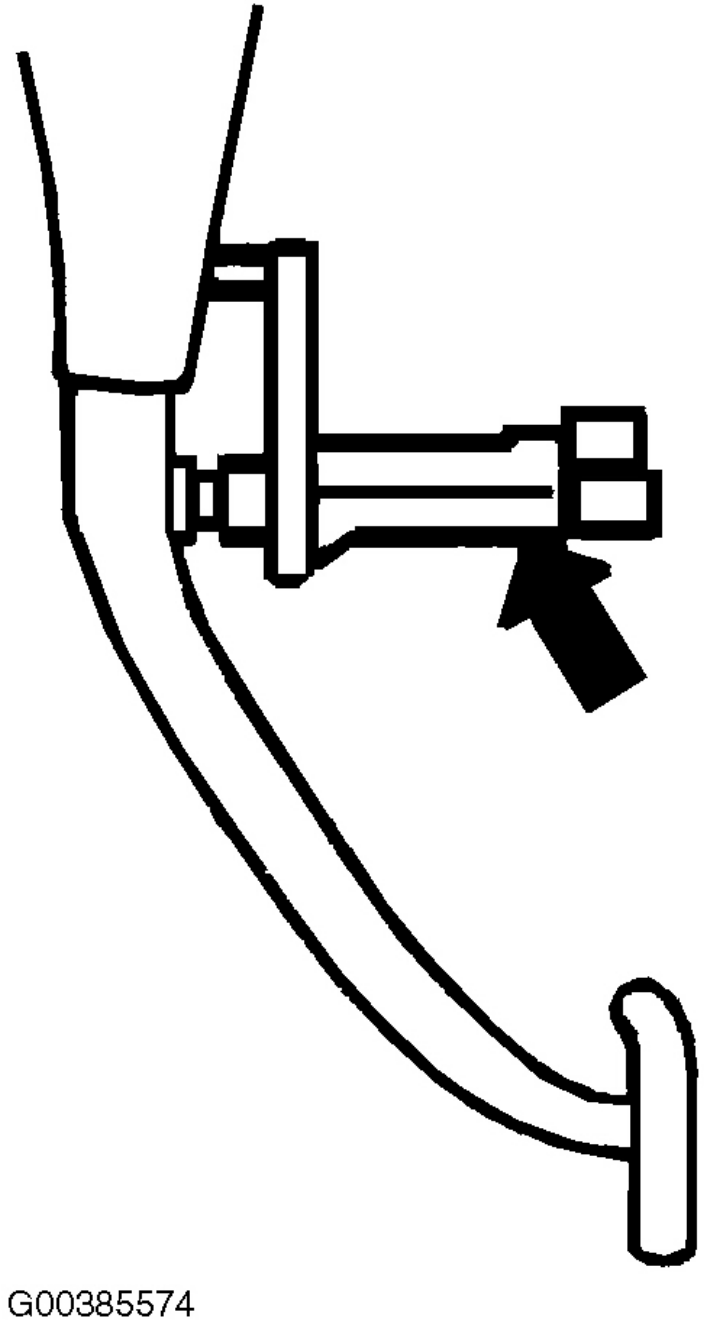


Fig. 22: Identifying Brake Light Switch
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Removal & Installation

For removal and installation procedures, see **DISC** article in BRAKES.

Park/Neutral Position (PNP) Relay -J226-

Location: on additional relay carrier under instrument panel, left side. Relay is marked with number "175" (arrow). See **Fig. 23** .

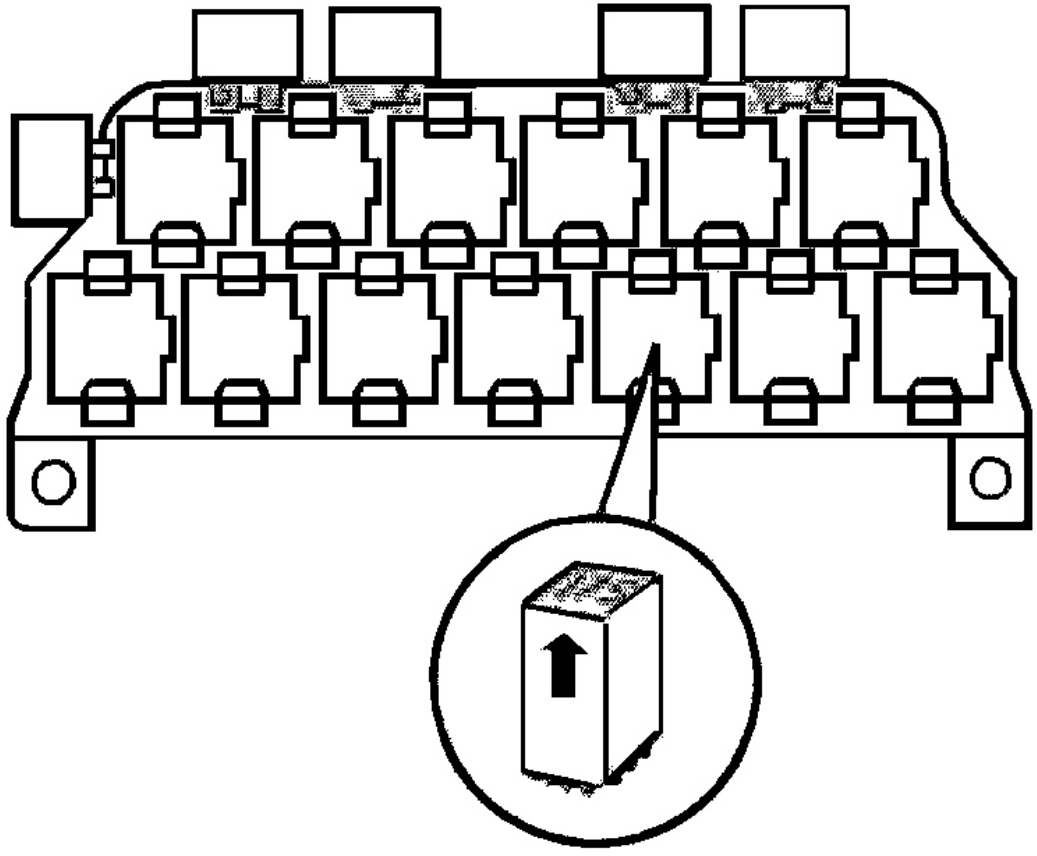


Fig. 23: Identifying Park/Neutral Position Relay
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Transmission Vehicle Speed Sensor -G38-

Location: on top of transmission.

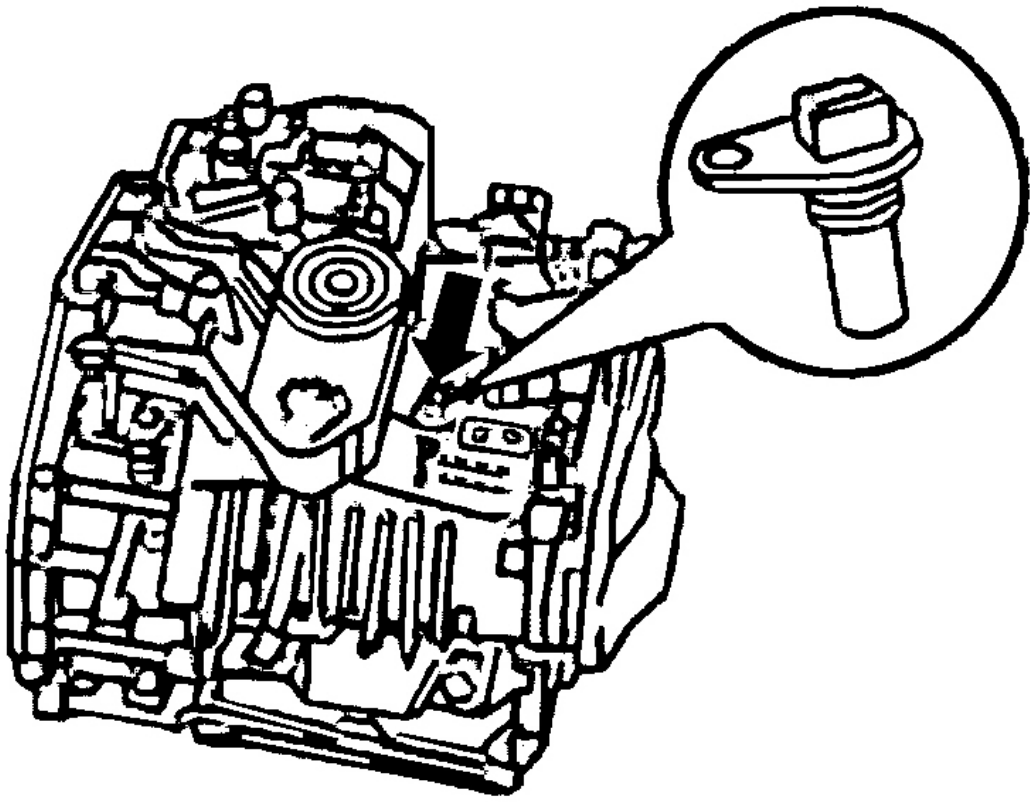


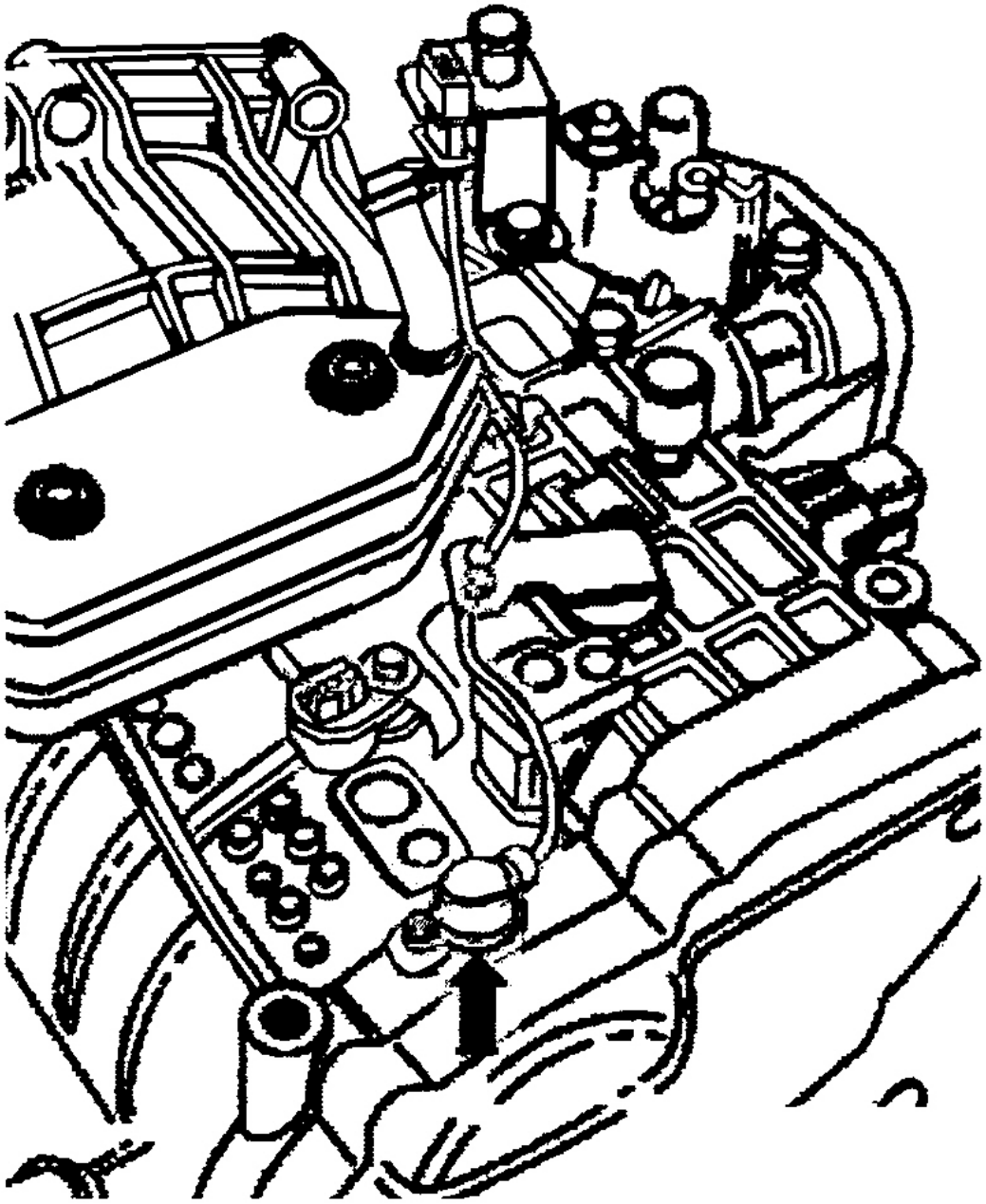
Fig. 24: Identifying Transmission Vehicle Speed Sensor
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Removal & Installation

1. Switch off ignition.
2. Disconnect connector from sensor.
3. Remove bolt and take out sensor.
4. Replace seal.
5. Installation is performed in the reverse order.
6. Tighten bolt to 10 Nm (7 ft lb).

Vehicle Speed Sensor (VSS) -G68-

Location: on top of transmission. When the transmission is installed the sensor is covered by the left transmission mount.



G00385577

Fig. 25: Identifying Vehicle Speed Sensor
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Removal & Installation

NOTE: For additional information, see REMOVAL & INSTALLATION - A/T (01M) article.

1. Obtain radio code for vehicles with coded radio.
2. Switch ignition off and disconnect battery ground strap.
3. Remove battery.
4. Remove air cleaner.

CAUTION: DO NOT remove bolts for transmission carrier (arrows) until transmission has been supported.

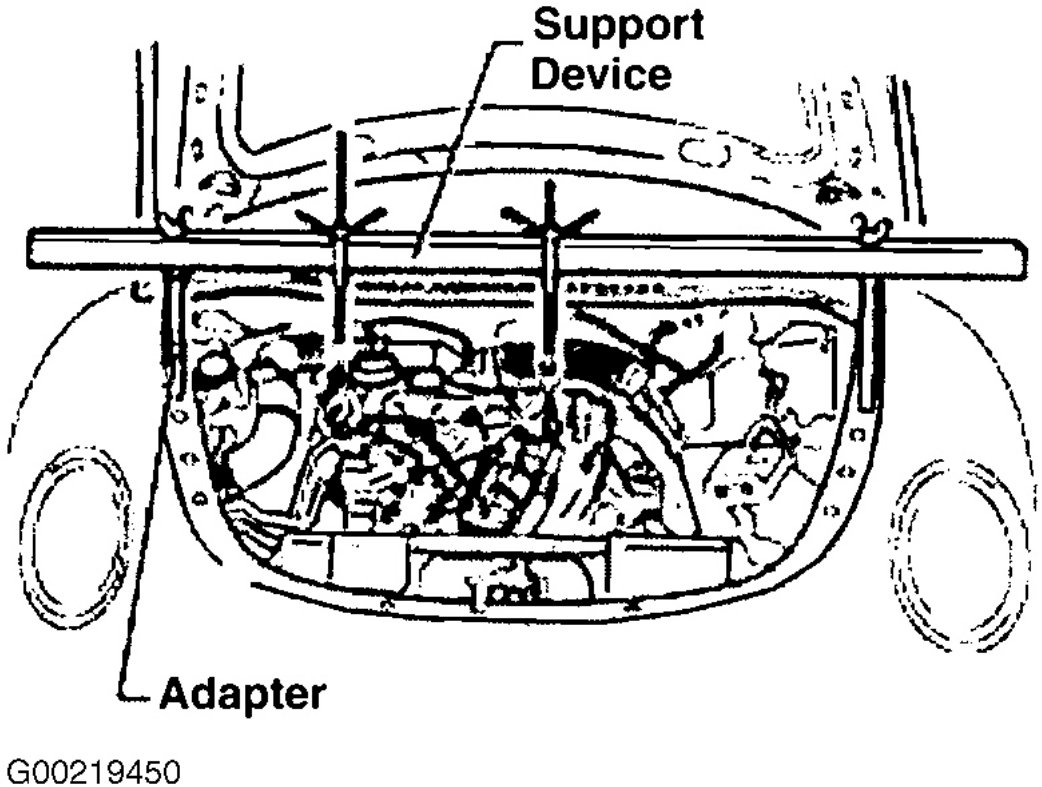


Fig. 26: Installing Support Device & Adapters To Vehicle
Courtesy of VOLKSWAGEN UNITED STATES, INC.

5. Install support bar 10-222 A with legs 10-222 A/8 and support engine/transmission in position. See **Fig. 26** .
6. Remove bracket for power steering pressure hose.
7. Remove pendulum support (arrows). See **Fig. 27** .

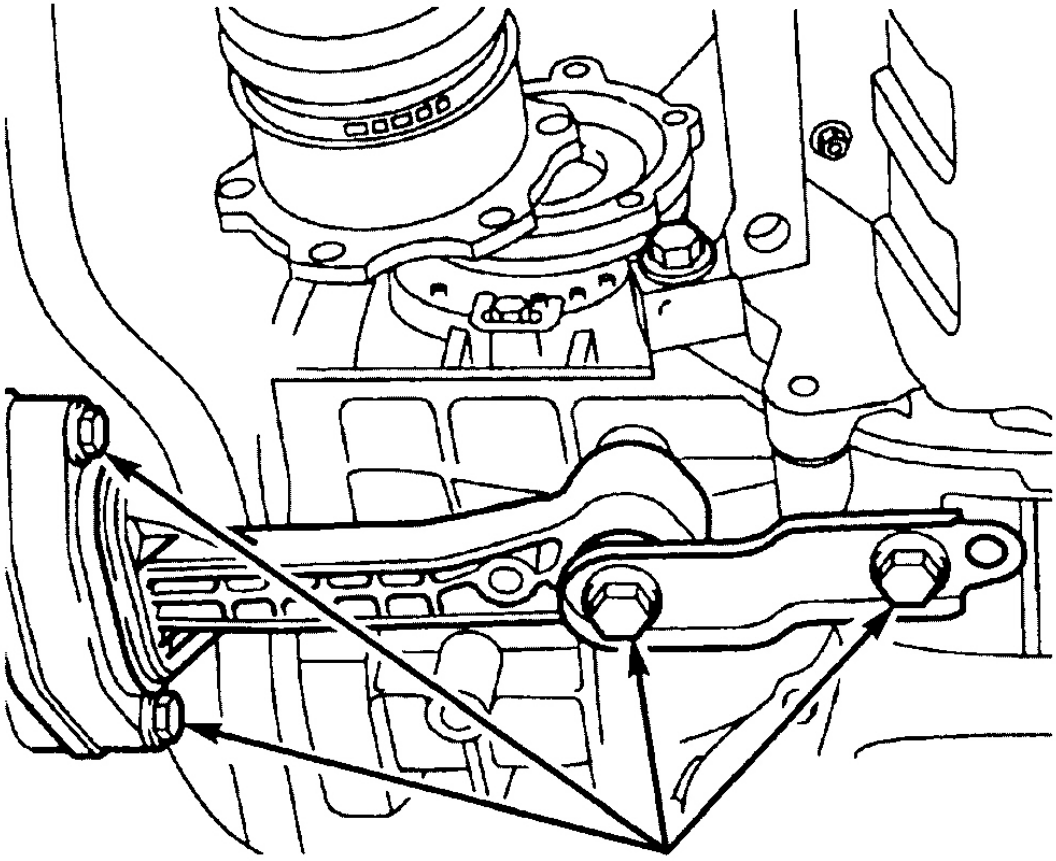


Fig. 27: Locating Pendulum Support Bolts
Courtesy of VOLKSWAGEN UNITED STATES, INC.

8. Lower transmission approx. 60 mm (2.4 in.). See dimension a in **Fig. 28** .

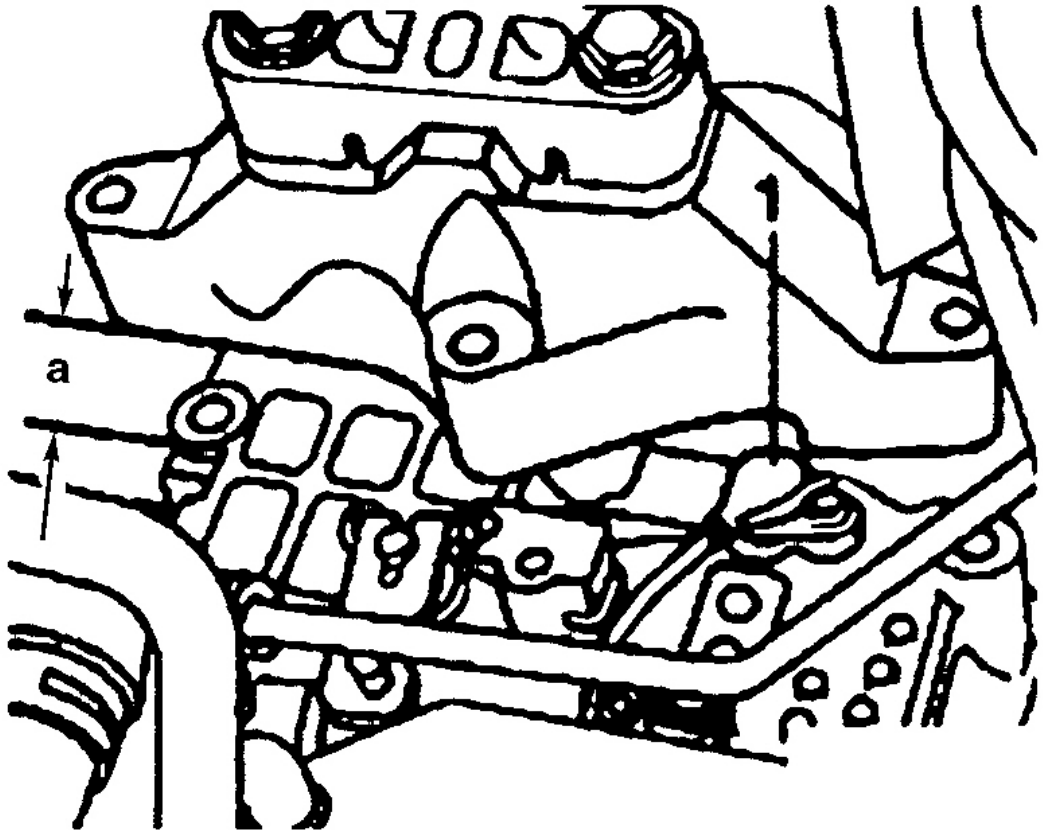


Fig. 28: Identifying Transmission Height & Vehicle Speed Sensor
Courtesy of VOLKSWAGEN UNITED STATES, INC.

9. Disconnect black connector from sensor.
10. Remove bolt and take sensor -1- out. See **Fig. 28** .
11. Replace seal.
12. Installation is performed in the reverse order. Use NEW pendulum support bolts.

NOTE: For additional torque specifications, see TORQUE SPECIFICATIONS in REMOVAL & INSTALLATION - A/T (01M) article.

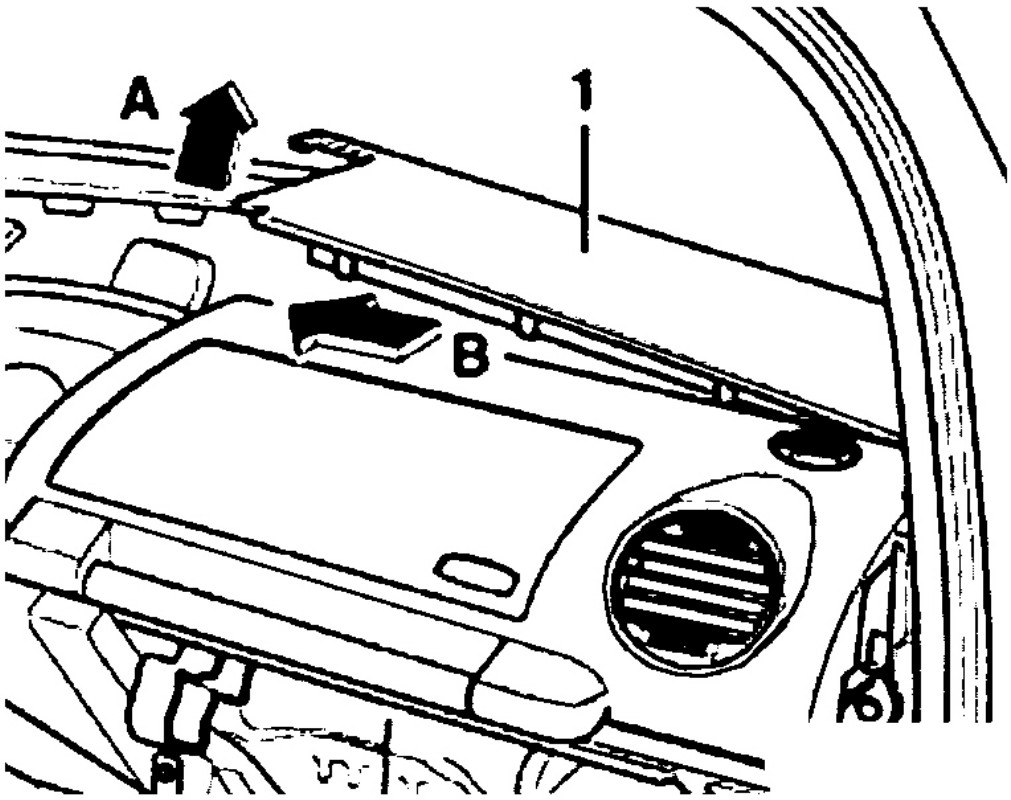
13. Tighten bolt to 10 Nm (7 ft lb).

Transmission Control Module (TCM) -J217-

The control module (arrow) is located in the plenum chamber, center right.

Removing & Installing

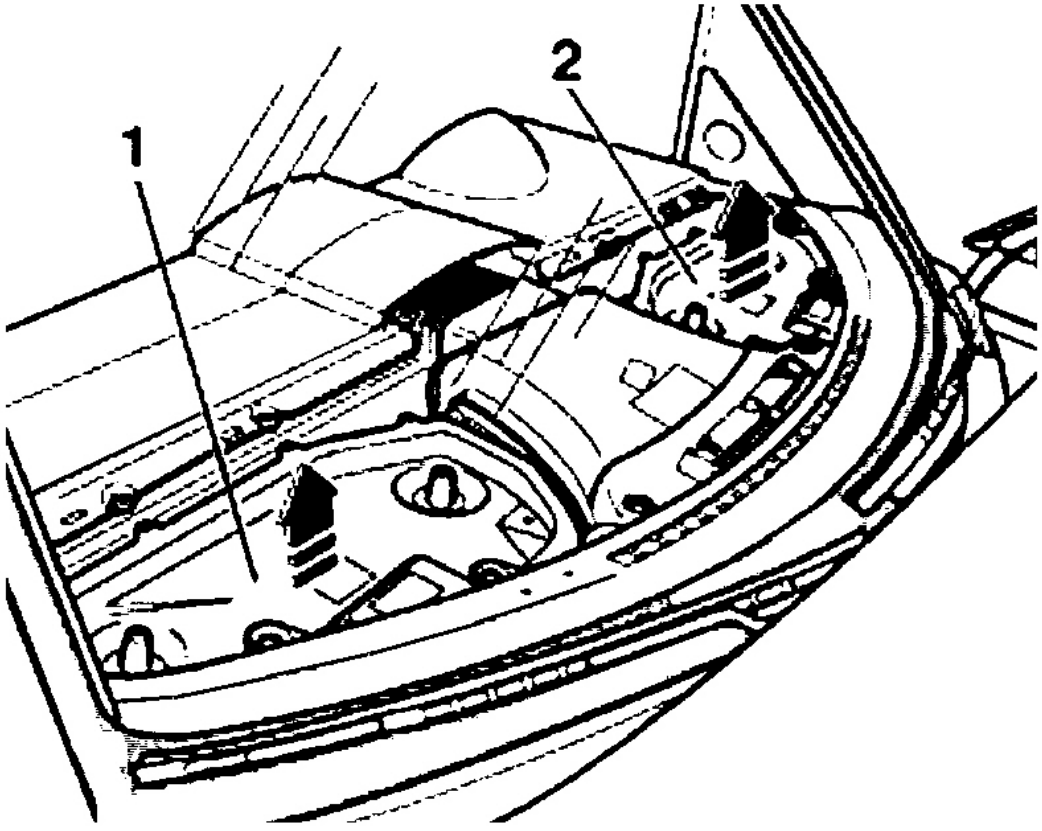
1. Switch off ignition.
2. Slide plenum chamber center cover -1- forward out of its locking device and take off of dash panel -arrow-. See **Fig. 8** .
3. Remove screws -1- (Qty. 3). See **Fig. 9** .
4. Lift left-hand plenum chamber cover -1- in the center of the instrument panel -arrow A-, this action unclips the panel (front and rear edges are clipped). See **Fig. 10** .
5. Pull cover -1- toward center of instrument panel and out of retainers in A-pillar -arrow B-. See **Fig. 10** .
6. Lift right-hand plenum chamber cover -1- in the center of the instrument panel -arrow A-, this action unclips the panel (front and rear edges are clipped). See **Fig. 29** .



G00385584

Fig. 29: Removing Right Plenum Chamber Cover
Courtesy of VOLKSWAGEN UNITED STATES, INC.

7. Pull cover -1- toward center of instrument panel and out of retainers in A-pillar -arrow B-. See **Fig. 29** .
8. Remove securing screws from the right-hand sealing part -1- or the left-hand sealing part -2- and take sealing part off plenum chamber upward. See **Fig. 30** .



G00385586

Fig. 30: Removing Plenum Chamber Seal
Courtesy of VOLKSWAGEN UNITED STATES, INC.

9. Disconnect multi-pin connector, then remove connector from control module. See **Fig. 31** .

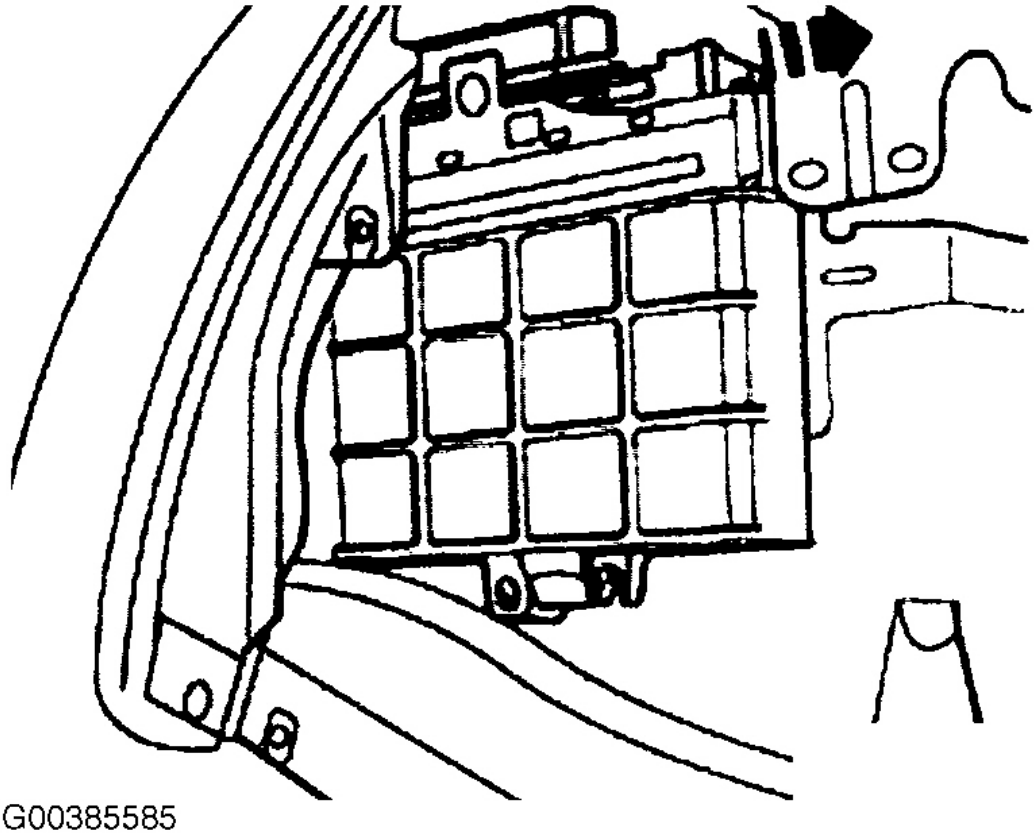


Fig. 31: Removing Multi-Pin Connector From Transmission Control Module
Courtesy of VOLKSWAGEN UNITED STATES, INC.

10. Remove screws (arrows). See **Fig. 32** .

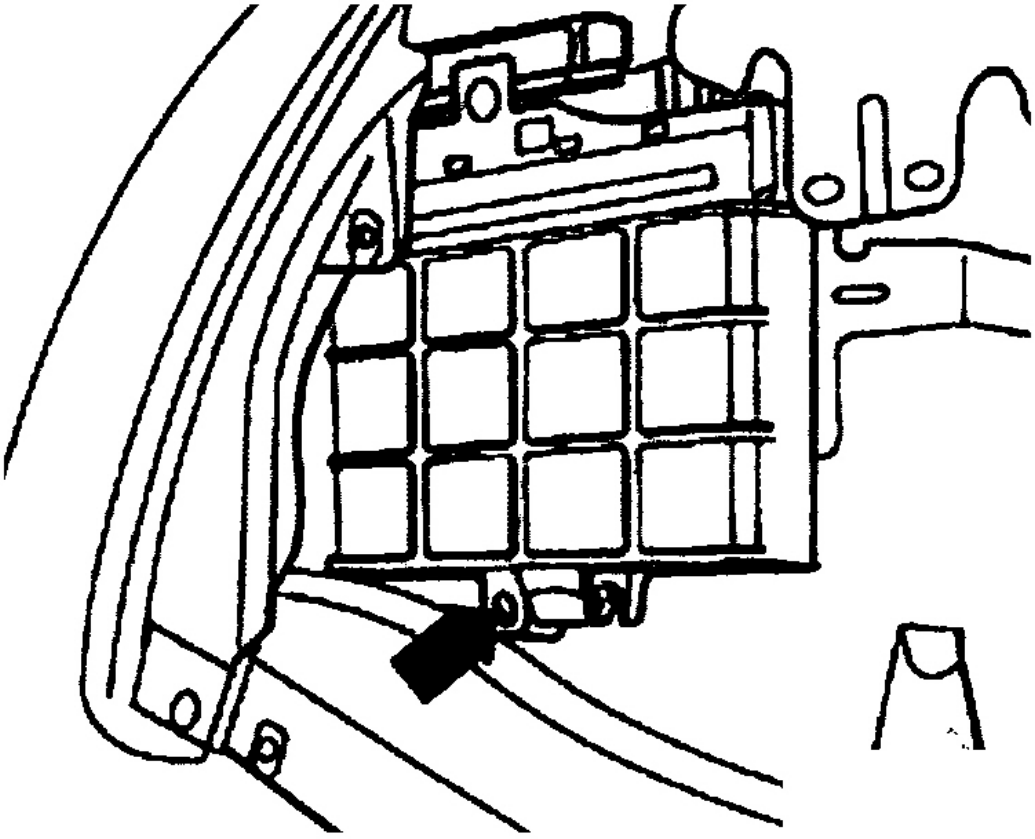


Fig. 32: Removing Transmission Control Module Screws
Courtesy of VOLKSWAGEN UNITED STATES, INC.

11. Remove control module.
12. Install the TCM in the reverse order of removal and note the following:
    - Locate multi-pin connector on TCM -J217- pins (arrows) then lock connector. See **Fig. 33** .

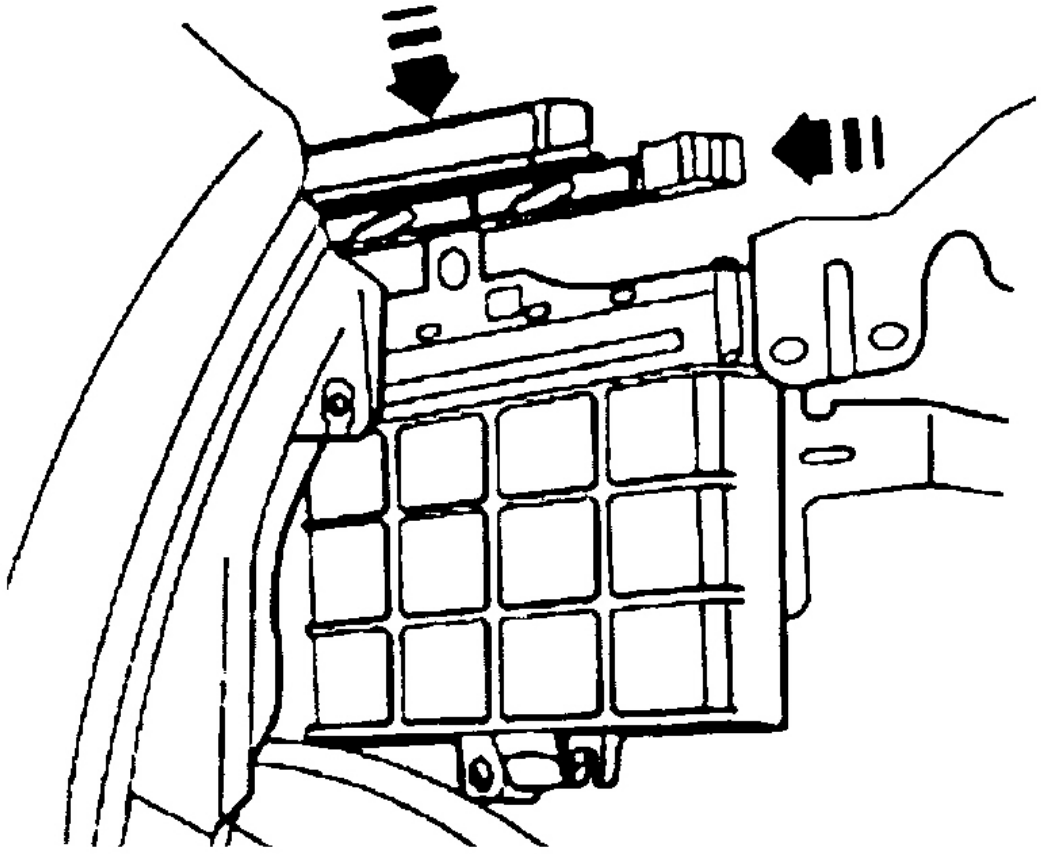


Fig. 33: Locking TCM Multi-Pin Connector
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Perform On Board Diagnostic (OBD). See **ON BOARD DIAGNOSTIC (OBD), CONDUCTING** .
- Initiate basic setting. See **BASIC SETTING, INITIATING** under ON BOARD DIAGNOSTIC (OBD), CONDUCTING.

ON BOARD DIAGNOSTIC (OBD), CONDUCTING

SPECIAL TOOLS, TESTERS & AUXILIARY ITEMS

- VAG 1551 Scan Tool. See **Fig. 12** .
- VAG 1551/3A Adapter. See **Fig. 12** .

ADDITIONAL INFORMATION

For additional informations, see:

- **REMOVAL & INSTALLATION - A/T (01M)** article
- Appropriate SYSTEM WIRING DIAGRAM article in ELECTRICAL
- Available Parts catalog

VAG 1551 SCAN TOOL, CONNECTING AND SELECTING FUNCTIONS

WARNING: Test and measuring instruments must be secured to the rear seat and operated by a second technician from this location.

Test Conditions

- Vehicle voltage supply OK
- Fuses No. 07, 11, 15 and 31 OK
- Fuse in main fuse box (110 amps.) OK
- Ground connections for transmission OK. Ground connecting points are located in plenum chamber and below the battery in engine compartment.
- Check Ground connections for corrosion and poor contact; repair if necessary.
- Check battery Ground strap and Ground strap between battery and transmission.
- Selector lever in "P" and parking brake applied.

Notes

- The DLC may be found in the center console on some vehicles.
- Additional operating instructions can be retrieved by pressing the HELP button of VAG 1551.
- The "right arrow" button is used for advancing within the program sequence.
- An automatic check (buttons 00) can be selected in operating mode 1 "Rapid data transfer". All vehicle control modules will then be checked automatically.
- See scan tool manufacturer operational booklet for additional procedures and notes.

Connecting & Selecting Functions

1. Switch ignition off and connect VAG 1551 Scan Tool with adapter VAG 1551/3A. See **Fig. 12** .
2. Switch on ignition.
3. Switch on printer with Print button (indicator lamp in button lights).
4. Press button 1 for "Rapid data transfer" mode. See **Fig. 34** .

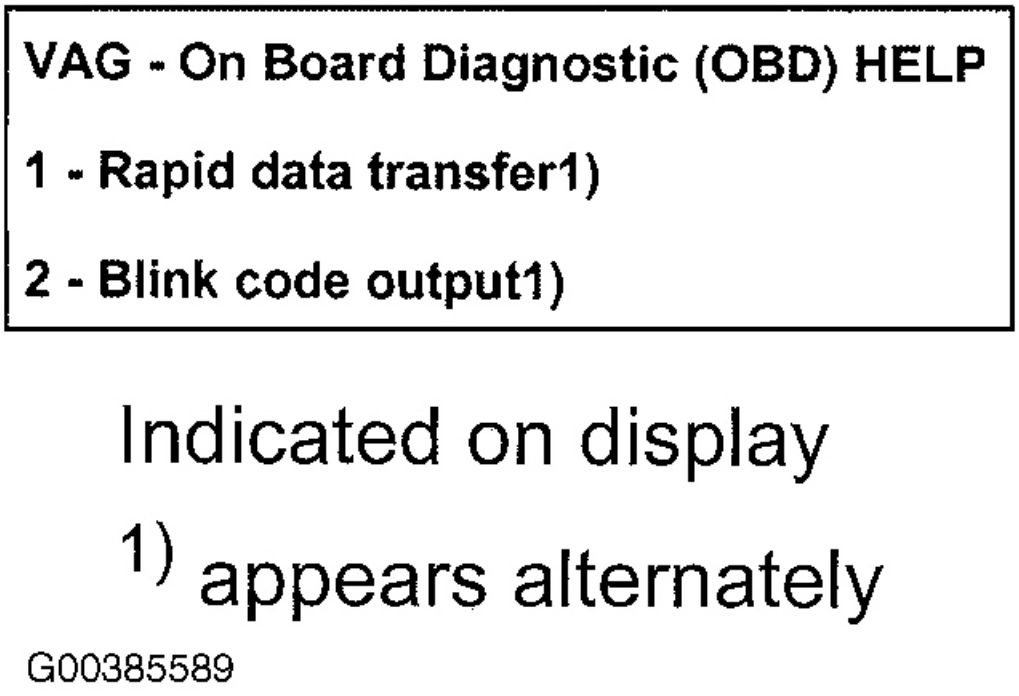

VAG - On Board Diagnostic (OBD) HELP
1 - Rapid data transfer1)
2 - Blink code output1)
Indicated on display
1) appears alternately
G00385589

Fig. 34: Scan Tool Display (1 Of 4)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

5. Press buttons -0- and -2- to enter "transmission electronics" address word 02. See **Fig. 35** .

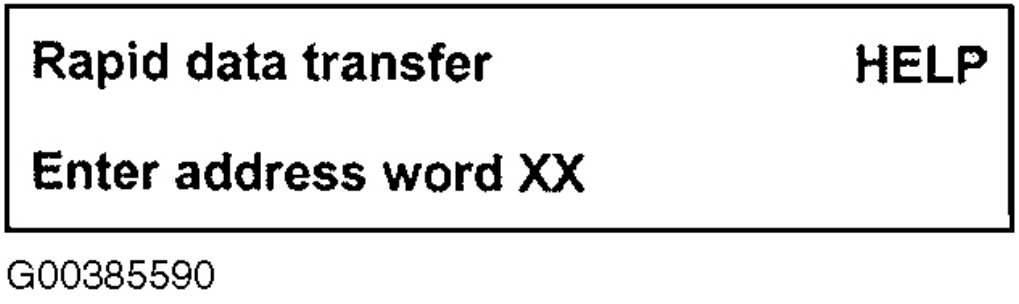


Fig. 35: Scan Tool Display (2 Of 4)

Courtesy of VOLKSWAGEN UNITED STATES, INC.

6. Confirm entry with -Q- button. See **Fig. 36** .

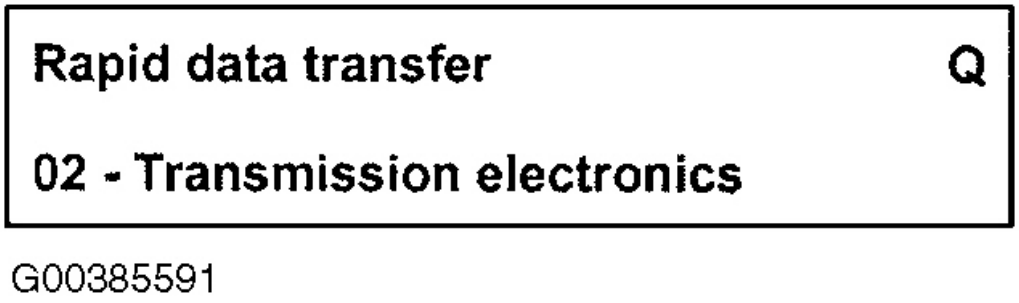


Fig. 36: Scan Tool Display (3 Of 4)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

7. Example: The control module identification, the coding and the dealership number of the VAG 1551 are displayed. See **Fig. 37** .

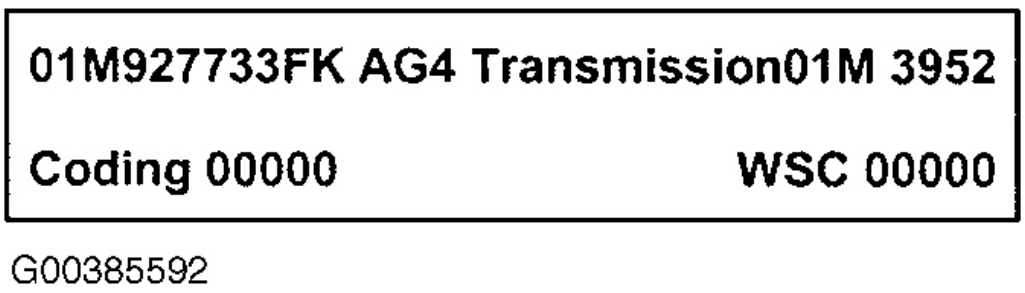


Fig. 37: Scan Tool Display (4 Of 4)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

CONTROL MODULE IDENTIFICATION

Depending upon build level (program level) the control module can indicate a different control module identification to that shown in the example.

- 01M 927 733 FK: Part No.
- AG4 transmission 01M: 4-speed automatic transmission 01M
- 3952: EPROM (Program level)
- Coding 00000: not required at present.
- WSC 00000: VAG 1551 dealership number with which the last coding was performed.
- If "Control module does not answer!" appears, press HELP button to print out a list of possible fault causes. After eliminating possible causes of faults, again enter the address word 02 for "transmission electronics" and confirm.
- If "Control module does not answer!" again appears:
    a. Check control module voltage supply.
    b. Perform test step 1. See **TRANSMISSION: ELECTRICAL TEST** .
    c. Check wiring connections to Data Link Connector (DLC). See appropriate WIRING article in ELECTRICAL.
    d. Check under DTC 65535, control module faulty! See **DIAGNOSTIC TROUBLE CODE (DTC) TABLE** .
    e. Press "right arrow" button.
    f. Display should be similar to illustration. See **Fig. 38** . After the HELP button is pressed, a list of the possible functions is printed out.

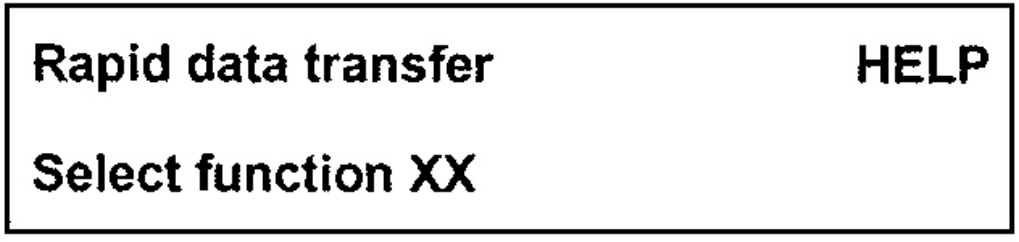


Fig. 38: Scan Tool Function Select Display Screen
Courtesy of VOLKSWAGEN UNITED STATES, INC.

LIST OF SELECTABLE FUNCTIONS

The VAG 1551 Scan Tool returns to the following start position after checking each function. See **Fig. 38** .

SELECTABLE SCAN TOOL FUNCTIONS

Function No.	Description

01	**Check Control Module Version - On Board Diagnostic (OBD), Conducting**
02	**Check Diagnostic Trouble Code (DTC) Memory**
04	**Initiate Basic Setting** .
05	**Erase DTC Memory** .
06	End Output.
08	**Read Measured Value Block** .

NOTE: Further functions, which can be printed out by pressing the HELP button, need not be considered.

DIAGNOSTIC TROUBLE CODE (DTC) MEMORY, CHECKING

1. Connect VAG 1551 Scan Tool and enter address word "02 Transmission electronics".
2. Advance until "Select function XX" appears in display. See **Connecting & Selecting Functions** .
3. Press buttons -0- and -2- to select "Check DTC memory". See **Fig. 38** .
4. Confirm entry with -Q- button (A). See **Fig. 39** .

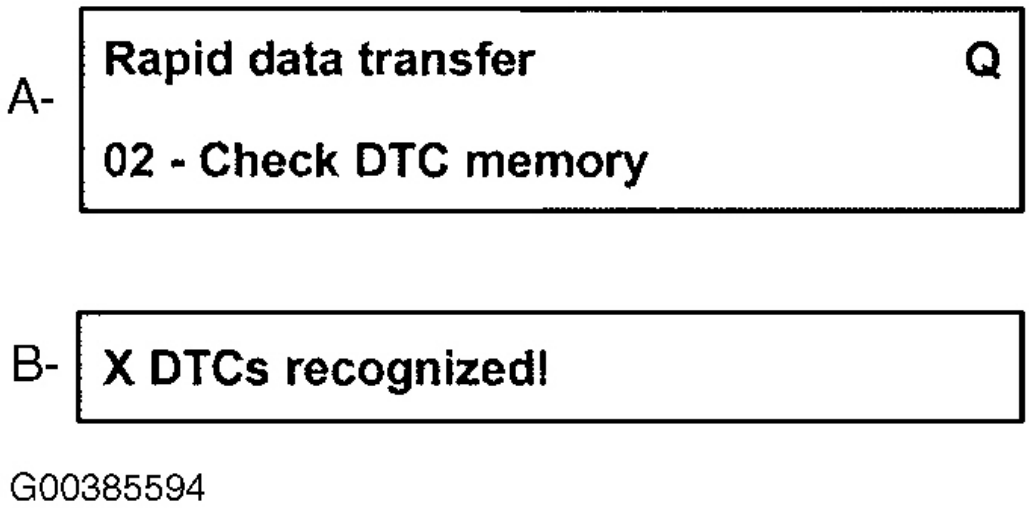


Fig. 39: Scan Tool Check DTC Memory Display Screen
Courtesy of VOLKSWAGEN UNITED STATES, INC.

5. The number of stored DTCs or "No DTC recognized" appears in the display (B). See **Fig. 39** . The stored DTCs are displayed in turn and printed out. After the last DTC has been displayed and printed out:
   - Correct malfunctions as described in the DTC table. See **DIAGNOSTIC TROUBLE CODE (DTC) TABLE** .

- Press "right arrow" button.

6. After checking the DTC memory and correcting the malfunctions, erase DTC memory. See **DIAGNOSTIC TROUBLE CODE (DTC) MEMORY, ERASING** .

DIAGNOSTIC TROUBLE CODE (DTC) TABLE

Notes

- All the possible DTCs which are recognized by the Transmission Control Module -J217- and displayed on the VAG 1551 Scan Tool with the printer switched on, are listed below grouped according to the DTC number.
- If malfunctions occur only occasionally or if the DTC memory was not erased after correcting the malfunctions, these will be displayed as "sporadic malfunctions" for a stipulated period of time. See **TCM -J217- Malfunction Recognition** .
- If components are indicated as being faulty when the DTC memory is checked, additionally test the wiring to the components for short and open circuits according to the wiring diagram. See appropriate SYSTEM WIRING article in ELECTRICAL.
- The DTC and (with 7.0 program card) the type of malfunction in numbers is printed out in the "rapid data transfer" mode only when the VAG 1551 printer is switched on. Example: DTC (5-position) 65535 XYZ (type of DTC, explained in text below component name). See **Fig. 40** .

Output on printer VAG 1551	
No DTC recognized!	If "No DTC recognized" appears after performing repairs, the On Board Diagnostic (OBD) is completed. If the automatic transmission does not operate properly after checking the DTC memory and correcting any malfunctions: See MEASURED VALUE BLOCK, READING

G00385595

Fig. 40: DTC Table Example
Courtesy of VOLKSWAGEN UNITED STATES, INC.

DIAGNOSTIC TROUBLE CODE (DTC)

OBD II DTC (1)	VAG DTC	Related Component
.....	**00258**	Solenoid Valve 1
.....	**00260**	Solenoid Valve 2
.....	**00262**	Solenoid Valve 3
.....	**00264**	Solenoid Valve 4

.....	**00266**	Solenoid Valve 5
.....	**00268**	Solenoid Valve 6
.....	**00270**	Solenoid valve 7
.....	**00281**	Vehicle Speed Sensor
.....	**00293**	Multi-Function Transmission Range Switch
.....	**00297**	Transmission Vehicle Speed Sensor
.....	**00300**	Transmission Fluid Temperature Sensor
.....	**00518**	Throttle Position Sensor
.....	**00529**	Speed Information Missing
.....	**00532**	Supply Voltage
.....	**00545**	Engine/Transmission Electrical Connection
.....	**00638**	Engine/Transmission Electrical Connection 2
.....	**00641**	ATF Temperature
.....	**00652**	Gear Monitoring
.....	**00660**	Kick down Switch/Throttle Position Sensor
.....	**01192**	Torque Converter Lock-Up Clutch
.....	**01236**	Shift Lock Solenoid
.....	**01312**	CAN-Bus Drive
.....	**01314**	Engine Control Module
.....	**01316**	ABS Control Module
.....	**65535**	Control Module Faulty
(1) Manufacturer does not provide OBD II DTCs.		

DTC 00258 & 00260

VAG 1551 print-out See DTC Notes	Possible cause of malfunction	Correcting malfunction
00258 Solenoid valve 1 -N88- Open circuit1) Short to Ground1) Open circuit/short to Ground1) Short to positive1)	Wiring open or short circuit Solenoid valve 1 - N88- faulty	- Check wiring and connections according to wiring diagram2) - Read measured value block See MEASURED VALUE BLOCK, READING display group number 004
00260 Solenoid valve 2 -N89- Open circuit1) Short to Ground1) Open circuit/short to Ground1) Short to positive1)	Wiring open or short circuit Solenoid valve 2 - N89- faulty	- Check wiring and connections according to wiring diagram 2) - Read measured value block See MEASURED VALUE BLOCK, READING display group number 004

1) One of these displays appears in addition to the relevant component.

2) First check the connections for contact corrosion or water ingress and replace if necessary. If solenoid DTCs are displayed check the 10-pin connector on the transmission between the valve body conductor strip and the wiring harness.

G00385596

Fig. 41: DTC 00258 & 00260 Tables
Courtesy of VOLKSWAGEN UNITED STATES, INC.

DTC 00262 & 00264

VAG 1551 print-out See DTC Notes	Possible cause of malfunction	Correcting malfunction
00262 Solenoid valve 3 -N90- Open circuit1) Short to Ground1) Open circuit/short to Ground1) Short to positive1)	Wiring open or short circuit Solenoid valve 3 - N90- faulty	- Check wiring and connections according to wiring diagram - Read measured value block See MEASURED VALUE BLOCK, READING display group number 004
00264 Solenoid valve 4 -N91- Open circuit1) Short to Ground1) Open circuit/short to Ground1) Short to positive1)	Wiring open or short circuit Solenoid valve 4 - N91- faulty	- Check wiring and connections according to wiring diagram 2) - Read measured value block See MEASURED VALUE BLOCK, READING display group number 004

1) One of these displays appears in addition to the relevant component.

2) First check the connections for contact corrosion or water ingress and replace if necessary. If solenoid DTCs are displayed check the 10-pin connector on the transmission between the valve body conductor strip and the wiring harness.

G00385597

Fig. 42: DTC 00262 & 00264 Tables
Courtesy of VOLKSWAGEN UNITED STATES, INC.

DTC 00266 & 00268

VAG 1551 print-out See DTC Notes	Possible cause of malfunction	Correcting malfunction
00266 Solenoid valve 5 -N92- Open circuit1) Short to Ground1) Open circuit/short to Ground1) Short to positive1)	Wiring open or short circuit Solenoid valve 5 - N92- faulty	- Check wiring and connections according to wiring diagram 2) - Read measured value block See MEASURED VALUE BLOCK, READING display group number 004
00268 Solenoid valve 6 -N93- Open circuit1) Short to Ground1) Open circuit/short to Ground1) Short to positive1)	Wiring open or short circuit Solenoid valve 6 - N93- faulty	- Check wiring and connections according to wiring diagram 2) - Read measured value block See MEASURED VALUE BLOCK, READING display group number 002

1) One of these displays appears in addition to the relevant component.

2) First check the connections for contact corrosion or water ingress and replace if necessary. If solenoid DTCs are displayed check the 10-pin connector on the transmission between the valve body conductor strip and the wiring harness.

G00385598

Fig. 43: DTC 00266 & 00268 Tables
Courtesy of VOLKSWAGEN UNITED STATES, INC.

DTC 00270 & 00281

VAG 1551 print-out See DTC Notes	Possible cause of malfunction	Correcting malfunction
00270 Solenoid valve 7 -N94- Open circuit1) Short to Ground1) Open circuit/short to Ground1) Short to positive1)	Wiring open or short circuit Solenoid valve 7 - N94- faulty	- Check wiring and connections according to wiring diagram 2) - Read measured value block See MEASURED VALUE BLOCK, READING display group number 004
00281 Vehicle Speed Sensor (VSS) - G68- No signal	Wiring open circuit Vehicle Speed Sensor (VSS) -G68- faulty	- Read measured value block See MEASURED VALUE BLOCK, READING display group number 002

1) One of these displays appears in addition to the relevant component.

2) First check the connections for contact corrosion or water ingress and replace if necessary. If solenoid DTCs are displayed check the 10-pin connector on the transmission between the valve body conductor strip and the wiring harness.

G00385599

Fig. 44: DTC 00270 & 00281 Tables
Courtesy of VOLKSWAGEN UNITED STATES, INC.

DTC 00293 & 00297

VAG 1551 print-out See DTC Notes	Possible cause of malfunction	Correcting malfunction
00293 Multi-Function Transmission Range (TR) Switch -F125- Undefined switch condition	Wiring open circuit Multi-Function Transmission Range (TR) Switch -F125- faulty	- First check multi-function TR switch connector for contact corrosion or water ingress, replace if necessary See COMPONENT LOCATIONS under ELECTRICAL/ELECTRONIC COMPONENTS - Read measured value block See MEASURED VALUE BLOCK, READING display group number 001
00297 Transmission Vehicle Speed Sensor (VSS) -G38- No signal1) Implausible signal1)	Wiring open circuit Transmission Vehicle Speed Sensor (VSS) -G38- faulty If the control module recognizes an implausible signal, the connectors for VSS -G38- and VSS -G68- are interchanged	- Check sensor connector for contact corrosion or water ingress, replace if necessary See COMPONENT LOCATIONS under ELECTRICAL/ELECTRONIC COMPONENTS - Perform electrical check See TRANSMISSION: ELECTRICAL TEST

1) One of these displays appears in addition to the relevant component.

G00385600

Fig. 45: DTC 00293 & 00297 Tables
Courtesy of VOLKSWAGEN UNITED STATES, INC.

DTC 00300

VAG 1551 print-out See DTC Notes	Possible cause of malfunction	Correcting malfunction
00300 Transmission Fluid Temperature Sensor -G93-1) No DTC type recognized	Wiring open circuit Transmission Fluid Temperature Sensor -G93- faulty	- Check connectors for contact corrosion or water ingress, replace if necessary. If the solenoid valves are indicated as being faulty check the 10-pin connector between conductor strip/valve body and wiring harness on the transmission. - Read measured value block See MEASURED VALUE BLOCK, READING display group number 005

1) A faulty Transmission Fluid Temperature Sensor -G93- is indicated.

G00385601

Fig. 46: DTC 00300 Table
Courtesy of VOLKSWAGEN UNITED STATES, INC.

DTC 00518

VAG 1551 print-out See DTC Notes	Possible cause of malfunction	Correcting malfunction
00518 Throttle Position (TP) Sensor -G69- Signal outside tolerance	Wiring open or short circuit Engine control module or TP sensor -G69- (in throttle valve control module or TP sensor -G79-) faulty	- Observe notes See COMPONENT LOCATIONS under ELECTRICAL/ELECTRONIC COMPONENTS - If this DTC is indicated, the engine control module OBD must always be performed For MY 1998: - Check grounds 12 and 607 according to wiring diagram For MY 1999 : - Check ground 607 according to wiring diagram - If additional DTCs: 00638 or 01312 or 01314 are displayed, these must be corrected first - Read measured value block See MEASURED VALUE BLOCK, READING display group numbers 001 and 003

G00385602

Fig. 47: DTC 00518 Table
Courtesy of VOLKSWAGEN UNITED STATES, INC.

DTC 00529 & 00532

Output on printer See DTC Notes	Possible cause of malfunction	Correcting malfunction
00529 Speed information missing	Wiring open circuit	- If additional DTCs: 01312 or 01314 are displayed, these must be corrected first - Check wiring and connectors according to wiring diagram, including CAN-Bus wiring For MY 1998: - Check grounds 12 and 607 according to wiring diagram For MY 1999: - Check ground 607 according to wiring diagram - Read measured value block See MEASURED VALUE BLOCK, READING display group number 003 - Check engine control module
00532 Supply voltage	Battery faulty Insufficient system voltage for valves	- Test battery voltage - Read measured value block See MEASURED VALUE BLOCK, READING display group number 002

G00385603

Fig. 48: DTC 00529 & 00532 Tables
Courtesy of VOLKSWAGEN UNITED STATES, INC.

DTC 00545

VAG 1551 print-out See DTC Notes	Possible cause of malfunction	Correcting malfunction
00545	Wiring open or short circuit	- If additional DTCs: 01312 or 01314 are displayed, these must be corrected first - Check wiring and connectors according to wiring diagram, including CAN-Bus wiring For MY 1998: - Check grounds 12 and 607 according to wiring diagram For MY 1999 : - Check ground 607 according to wiring diagram
Engine/transmission electrical connection Open circuit1) Short to Ground1) Open circuit/short to Ground1)	No engine/transmission control module connection The signal for influencing the ignition timing point is not transferred or transferred erroneously between engine and transmission control module	- Read measured value block See MEASURED VALUE BLOCK, READING display group number 005 - Check engine control module - Return system to basic setting See BASIC SETTING, INITIATING

1) One of these displays appears in addition to the relevant component.

G00385604

Fig. 49: DTC 00545 Table
Courtesy of VOLKSWAGEN UNITED STATES, INC.

DTC 00638

VAG 1551 print-out See DTC Notes	Possible cause of malfunction	Correcting malfunction
00638	Wiring open or short circuit	- If additional DTCs: 01312 or 01314 are displayed, these must be corrected first - Check wiring and connectors according to wiring diagram, including CAN-Bus wiring
Engine/transmission electrical connection 2 No signal	No engine/transmission control module connection Throttle position signal not transferred to transmission control module	- Read measured value block See MEASURED VALUE BLOCK, READING display group number 005 - Check engine control module, replace if necessary - Return system to basic setting See BASIC SETTING, INITIATING

G00385365

Fig. 50: DTC 00638 Table
Courtesy of VOLKSWAGEN UNITED STATES, INC.

DTC 00641

VAG 1551 print-out See DTC Notes	Possible cause of malfunction	Correcting malfunction
00641	Transmission becomes too hot, max. 148° C. If ATF temperature is too high, transmission shifts down into next lower gear.	- Check ATF level See SERVICING - A/T (01M) article. - Read measured value block See MEASURED VALUE BLOCK, READING display group number 005; read ATF temperature
ATF temperature	Trailer load of vehicle too high	- Observe proper load capacity
Signal too large1) No malfunction recognized1)	ATF level not OK Transmission fluid temperature sensor faulty	- Replace conductor strip See COMPONENT LOCATIONS under ELECTRICAL/ELECTRONIC COMPONENTS

1) One of these displays appears in addition to the relevant component.

G00385366

Fig. 51: DTC 00641 Table
Courtesy of VOLKSWAGEN UNITED STATES, INC.

DTC 00652 & 00660

VAG 1551 print-out See DTC Notes	Possible cause of malfunction	Correcting malfunction
00652 Gear monitoring Implausible signal	Electrical/hydraulic malfunction Clutch or valve body faulty	- Read measured value block See MEASURED VALUE BLOCK, READING display group number 004 and establish by driving in the gear where the malfunction occurs
00660 Kick Down Switch -F8-/ Throttle Position (TP) Sensor -G69-	Open circuit in wiring	- Check wiring and connections according to wiring diagram
	Throttle Position (TP) Sensor -G69- faulty	- If additional DTCs: 01312 or 01314 are displayed, these must be corrected first - Perform repairs as described in "Correcting malfunction" 00518 - Throttle Position (TP) Sensor -G69-
Implausible signal	Kick Down Switch -F8- faulty	- Read measured value block See MEASURED VALUE BLOCK, READING display group number 001

G00385367

Fig. 52: DTC 00652 & 00660 Tables
Courtesy of VOLKSWAGEN UNITED STATES, INC.

DTC 01192, 01236 & 01312

VAG 1551 print-out See DTC Notes	Possible cause of malfunction	Correcting malfunction
01192 Torque converter lock-up clutch mechanical fault	Torque converter lock-up clutch slipping Valve body faulty Internal failure in transmission	- Check torque converter lock-up clutch slip - Read measured value block See MEASURED VALUE BLOCK, READING display group number 007
01236 Shift Lock Solenoid - N110- Open circuit/short to Ground	Wiring open circuit or short to Ground Shift Lock Solenoid - N110- faulty	- Read measured value block See MEASURED VALUE BLOCK, READING display group number 005
01312 CAN-Bus drive faulty1) no communication1)	CAN-Bus wiring/connectors faulty	- Check CAN-Bus wiring and connectors according to wiring diagram

1) One of these displays appears in addition to the relevant component.

G00385368

Fig. 53: DTC 01192, 01236 & 01312 Tables
Courtesy of VOLKSWAGEN UNITED STATES, INC.

DTC 01314 & 01316

VAG 1551 print-out See DTC Notes	Possible cause of malfunction	Correcting malfunction
01314		
Engine control module no communication	CAN-Bus wiring/connectors faulty malfunction in system: Engine	- Check CAN-Bus wiring and connectors according to wiring diagram For MY 1998: - Check grounds 12 and 607 according to wiring diagram For MY 1999 : - Check ground 608 according to wiring diagram - Check engine control module
01316		
ABS control module No communication	CAN-Bus wiring/connectors faulty Malfunction in system: ABS	- Check CAN-Bus wiring and connectors according to wiring diagram For MY 1998: - Check grounds 12 and 607 according to wiring diagram For MY 1999 : - Check ground 608 according to wiring diagram - Check ABS control module See DISC article in BRAKES

G00385369

Fig. 54: DTC 01314 & 01316 Tables
Courtesy of VOLKSWAGEN UNITED STATES, INC.

DTC 65535

Output on printer See DTC Notes	Possible cause of malfunction	Correcting malfunction
65535 Control module faulty	Transmission Control Module -J217- faulty	- Replace control module See COMPONENT LOCATIONS under ELECTRICAL/ELECTRONIC COMPONENTS - Return system into basic setting See BASIC SETTING, INITIATING

Note:

Do not replace the Transmission Control Module -J217-, or return the system to basic setting , until the possible cause of any malfunction has been determined and the following types of malfunction have been corrected:

- *mechanical malfunctions*
- *hydraulic malfunctions*
- *all affected electrical/electronic components and wiring connections*

G00385370

Fig. 55: DTC 65535 Table
Courtesy of VOLKSWAGEN UNITED STATES, INC.

DIAGNOSTIC TROUBLE CODE (DTC) MEMORY, ERASING

1. Check DTC memory. See **DIAGNOSTIC TROUBLE CODE (DTC) MEMORY, CHECKING** .
2. Scan tool display should be similar to illustration. See **Fig. 38** . Press buttons -0- and -5- to select "Erase DTC memory" function 05.
3. Scan tool display should be similar to illustration (A). See **Fig. 56** . Confirm entry with -Q- button.

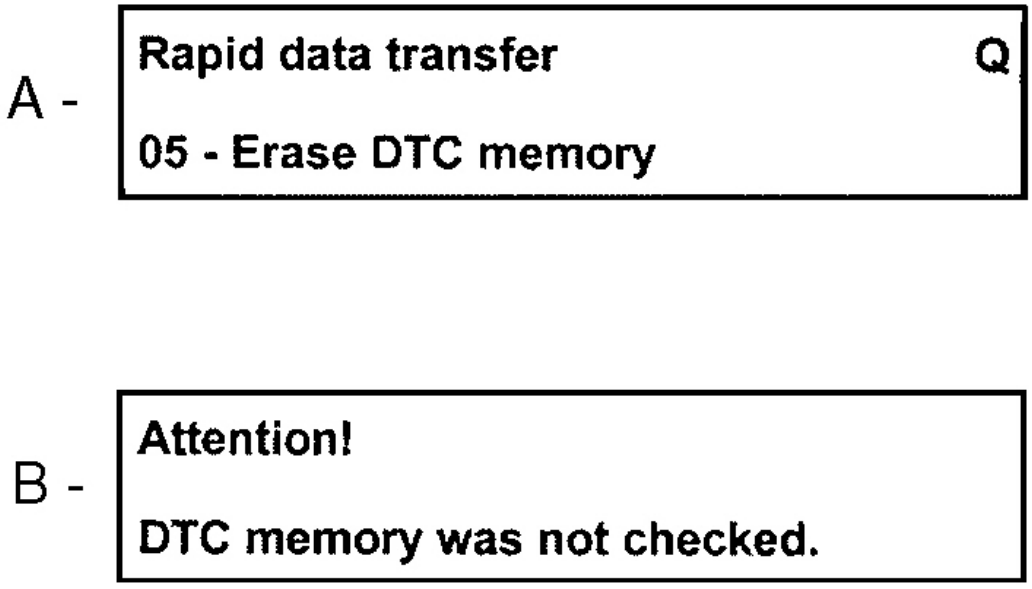


Fig. 56: Scan Tool Display (Erasing DTC Memory - 1 Of 2)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

NOTE: If the ignition was switched off between checking the DTC memory and erasing the DTC memory, the DTC memory will not be erased.

NOTE: Always adhere to the sequence of operations, that is. first check the DTC memory.

4. Scan tool display should be similar to illustration (B). See **Fig. 56** .
5. Scan tool display should be similar to illustration (A). See **Fig. 57** . The DTC memory will be erased approx. 5 secs. after the display appears. Wait about 1 minute before checking the DTC memory again.

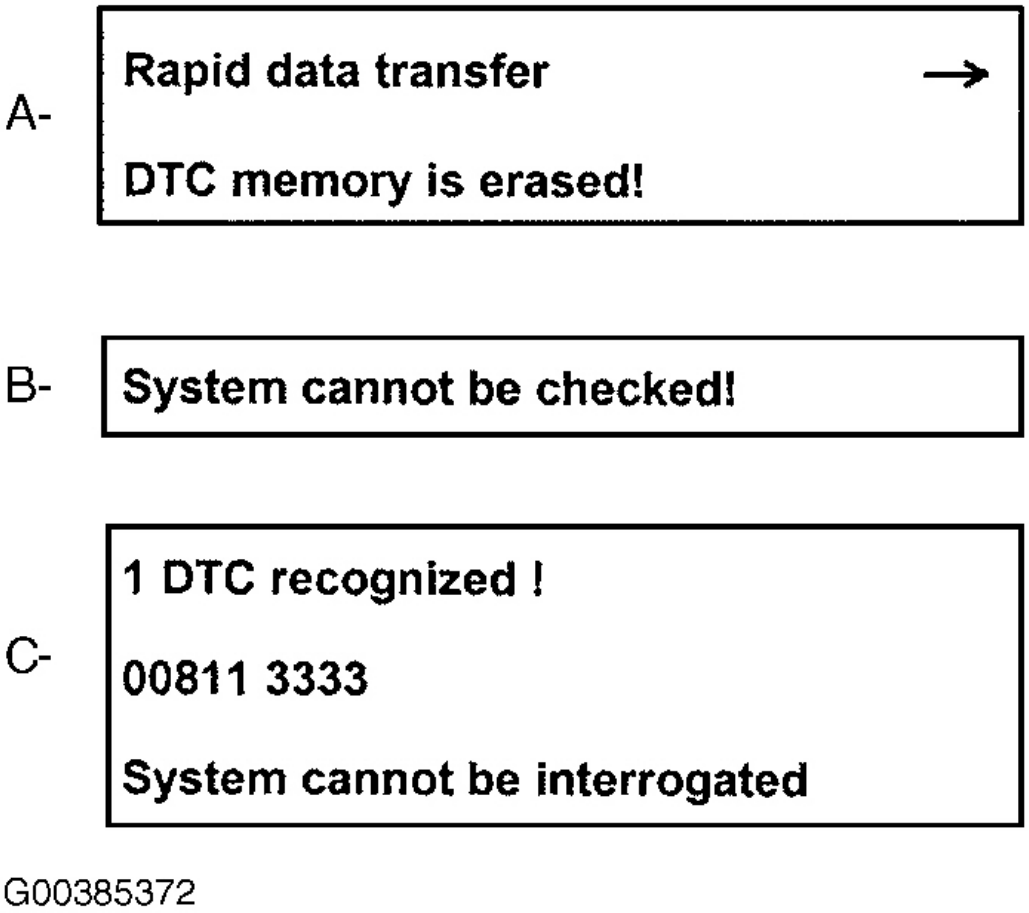


Fig. 57: Scan Tool Display (Erasing DTC Memory - 2 Of 2)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

6. Scan tool display should be similar to illustration (B). See **Fig. 57** . Print out with printer switched on (C), shows Transmission Control Module -J217- was not given sufficient time to recognize malfunctions. Wait about 1 minute before checking DTC memory again.
7. After checking and erasing DTC memory, test drive vehicle and check DTC memory again.
8. The following display should appear: "No DTC recognized!"

BASIC SETTING, INITIATING

Initiate the basic setting after performing the following repairs:

- Engine replacement
- Engine control module replacement

- Throttle valve replacement/adjustment (setting idling speed)
- Throttle Position (TP) Sensor -G69- replacement
- TP Sensor -G69- setting alteration, e.g. when adjusting Closed Throttle Position (CTP) Switch (engine)
- Transmission Control Module (TCM) -J217- replacement

1. Connect VAG 1551 Scan Tool and enter address word "02 transmission electronics" . Advance until "Select function XX" appears in display. See **VAG 1551 SCAN TOOL, CONNECTING AND SELECTING FUNCTIONS** .

NOTE: The accelerator pedal must remain in the idling position.

2. Scan tool display should be similar to illustration. See **Fig. 38** . Press buttons -0- and -4- to select "Initiating basic setting" function 04.
3. Scan tool display should be similar to illustration (A). See **Fig. 58** . Confirm entry with -Q- button.

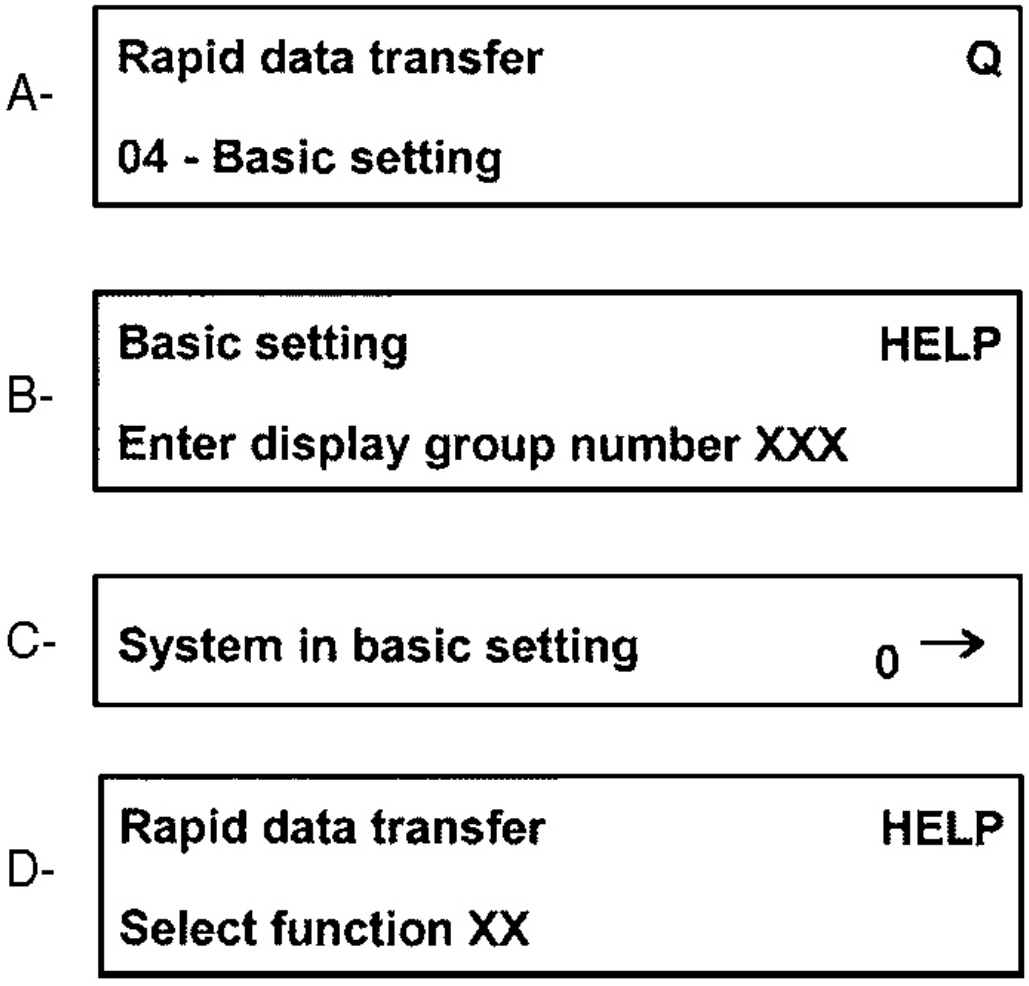


Fig. 58: Scan Tool Display (Basic Setting)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

4. Scan tool display should be similar to illustration (B). See **Fig. 58** . Press button -0-, -0- and -0-.
5. Confirm entry with -Q- button.
6. Scan tool display should be similar to illustration (C). See **Fig. 58** . The system is now in the basic setting. Depress accelerator pedal as far as kickdown and hold in this position for 3 seconds.
7. Press button "right arrow" button. Scan tool display should be similar to illustration (D). See **Fig. 58** .

MEASURED VALUE BLOCK, READING

1. Connect VAG 1551 Scan Tool and enter address word "02 transmission electronics". Advance until "Select function XX" indicated on display. See **VAG 1551 SCAN TOOL, CONNECTING AND SELECTING FUNCTIONS** .
2. Scan tool display should be similar to illustration (A). See **Fig. 59** . Press buttons -0- and -8- to select "Read measured value block" function 08.

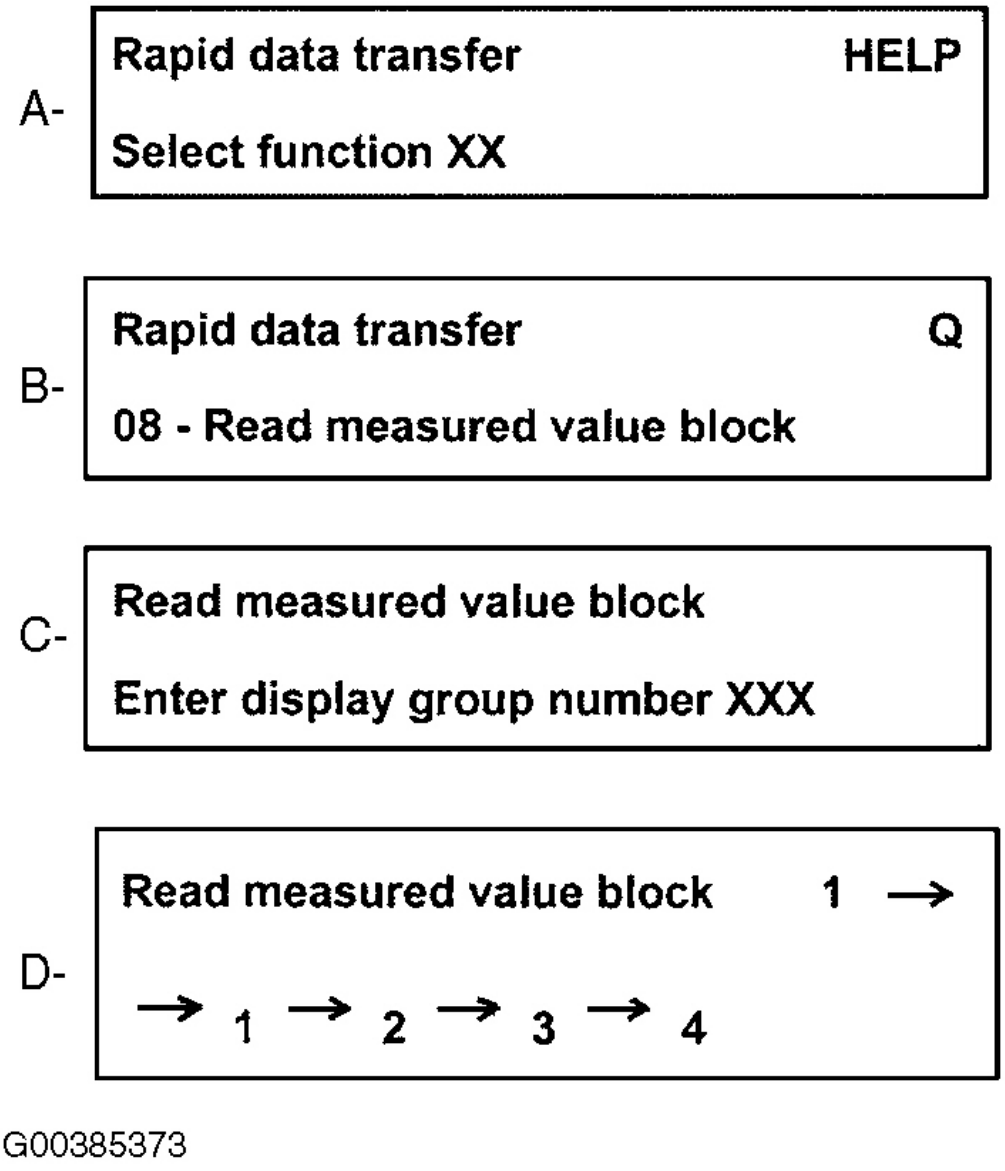


Fig. 59: Scan Tool Display (Measured Value Block Reading)

Courtesy of VOLKSWAGEN UNITED STATES, INC.

3. Scan tool display should be similar to illustration (B). See **Fig. 59** . Confirm entry with -Q- button.
4. Scan tool display should be similar to illustration (C). Enter display group number. See **LIST OF SELECTABLE DISPLAY GROUP NUMBERS** . Confirm entry with -Q- button.
5. Four display fields (D) always appear in the measured value block (in physical values if necessary). See **Fig. 59** . Decoding the individual values in display fields 1 to 4, see **TEST TABLE** .

List Of Selectable Display Group Numbers

NOTE: If the printer is switched on, the current display is printed out.

If the specified values are reached in all the display fields, press "right arrow" button. Scan tool display should be similar to illustration. See **Fig. 38** .

Indicated on display (example)			
Display fields: **1 2 3 4** |||	**Display group No.**	**Display field**	**Description**
Read measured value block 1 **P 0.8 V 0% 00000111**	001	1 2 3 4	Selector lever position Throttle position sensor voltage Accelerator pedal value Switch positions
Read measured value block 2 **0.983 A 0.985 A 12.76 V 2.50 V**	002	1 2 3 4	Solenoid valve 6 -N93- actual current Solenoid valve 6 -N93- specified current Battery voltage Voltage at Vehicle Speed Sensor -G68-
Read measured value block 3 **0 km/h 900 rpm 0 0 %**	003	1 2 3 4	Speed Engine speed Gear selected Accelerator pedal value
Read measured value block 4 **1000 00 0 P 0 km/h**	004	1 2 3 4	Solenoid valves Gear selected Selector lever position Speed
Read measured value block 5 **40 C 0011011 0 900 rpm**	005	1 2 3 4	ATF temperature Selector output Gear to be selected Engine speed

G00385375

Fig. 60: List Of Selectable Display Groups (1-5)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Indicated on display (example)			
Display fields: **1 2 3 4** |||	**Display group No.**	**Display field**	**Description**
Read measured value block 6	006	1 2 3 4	Not applicable
Read measured value block 7 **1H +/- 200 rpm 900 rpm 0 %**	007	1 2 3 4	Gear selected (+ or - sign relates to display field 2) Lock-up clutch slip Engine speed Accelerator pedal value
Read measured value block 8	006	1 2 3 4	Not applicable

G00385376

Fig. 61: List Of Selectable Display Groups (6-8)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

TEST TABLE (OBD)

Display Group No.	Display field	Designation	Test conditions		Specified readout on VAG 1551	Correcting malfunction
001	1	Selector lever position - Multi-Function Transmission Range (TR) Switch -F125-	Stationary	P	P	- Check and adjust selector lever cable See SERVICING - A/T (01M) article See TRANSMISSION: ELECTRICAL TEST
			Selector	R	R	
			lever	N	N	
			in	D	D	
				3	3	
				2	2	
cont'd				1	1	

G00385377

Fig. 62: Test Table (Group 1, Field 1)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Display Group No.	Display field	Designation	Test conditions	Specified readout on VAG 1551	Correcting malfunction
	2	Vehicles with CAN-Bus 1) Throttle Position (TP) Sensor -G69- signal	Idling	0 V	When accelerating from idling to wide open throttle, voltage figure constantly increases - Initiate basic setting See BASIC SETTING, INITIATING
			Wide open throttle max.	5 V	- Perform OBD for relevant engine - Adjust TP sensor, replace if necessary See appropriate REMOVAL, OVERHAUL & INSTALLATION article under ENGINE PERFORMANCE
Cont'd					

1) Observe notes.
See Throttle Position (TP) Sensor - G69 - under COMPONENT LOCATION under ELECTRICAL/ELECTRONIC COMPONENTS.

G00385378

Fig. 63: Test Table (Group 1, Field 2)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Group No.	Display field	Designation	Test conditions		Specified readout on VAG 1551	Correcting malfunction
001	3	Accelerator pedal value 1)	Stationary	Idling	0...1 %	When accelerating from idling to wide open throttle, % figure constantly increases
				Wide openthrottle	99...100 %	- Initiate basic setting See BASIC SETTING, INITIATING
	4	Switch positions Brake Light Switch -F- Display 1	Brake	Operated	1	- Check Brake Light Switch -F- Perform electrical tests See TRANSMISSION: ELECTRICAL TEST
				Not operated	0	
		Traction control system 2		Activated	1	not applicable
cont'd				Not activated	0	

1) Observe notes.
See Throttle Position (TP) Sensor - G69 - under COMPONENT LOCATION under ELECTRICAL/ELECTRONIC COMPONENTS.

G00385379

Fig. 64: Test Table (Group 1, Fields 3 & 4 - 1 Of 3)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Group No.	Display field	Designation	Test conditions		Specified readout on VAG 1551	Correcting malfunction
001	4	Display 3			0	Can be disregarded
					1	
		Kick down switch Display 4	Kickdown	Operated	1	Vehicles with accelerator cable: - Check kick down switch See TRANSMISSION: ELECTRICAL TEST
				Not operated	0	Vehicles without accelerator cable: - Perform OBD for relevant engine - Check wiring and connectors according to wiring diagram, including CAN-Bus wiring
cont'd						

G00385380

Fig. 65: Test Table (Group 1, Field 4 - 2 Of 3)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Group No.	Display field	Designation		Test conditions		Specified readout on VAG 1551	Correcting malfunction
001	4	MultiFunction Transmission Range (TR) switch -F125-	Display 5	Selector lever in	R, N, D, 3, 2	1	- Check and adjust selector lever cable See SERVICING - A/T (01M) article
					P, 1	0	
			6		P, R, 2, 1	1	
					N, D, 3	0	
			7		P, R, N, D	1	- Check multi-function TR switch See TRANSMISSION: ELECTRICAL TEST
					3, 2, 1	0	
			8		P, R, N,	1	
					D, 3, 2, 1	0	

G00385381

Fig. 66: Test Table (Group 1, Field 4 - 3 Of 3)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Group No.	Display field	Designation	Test conditions	Specified readout on VAG 1551	Correcting malfunction
002	1	Solenoid valve 6 -N93-	Selector lever in "N" Stationary Wide open throttle	0,000 A	The specified values were not attained in all drive situations.
			Idling max.	1,100 A	A malfunction occurs when actual current and specified current deviate from each other more than 0.050 A
	2	Solenoid valve 6 -N93- specified current	Selector lever in "N" Stationary Wide open throttle	0.0 A	- Initiate basic setting. See BASIC SETTING, INITIATING.
			Idling max.	1.1 A	- Check solenoid valve -N93-. See TRANSMISSION: ELECTICAL TEST
	3	Battery voltage	Stationary min.	10.8 V	- Check battery, replace if necessary - Check voltage supply to Transmission Control Module -J217-. See TRANSMISSION: ELECTICAL TEST
			max.	16.0 V	- Replace Transmission Control Module -J217-. See COMPONENT LOCATION under ELECTRICAL/ELECTRONIC COMPONENTS - Return system to basic setting. See BASIC SETTING, INITIATING.
Cont'd					

G00385382

Fig. 67: Test Table (Group 2, Fields 1, 2 & 3)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Group No.	Display field	Designation	Test conditions	Specified readout on VAG 1551	Correcting malfunction
002	4	Vehicle Speed Sensor -G68-	Stationary		- Check Vehicle Speed Sensor -G68- See TRANSMISSION: ELECTRICAL TEST
			min.	2.20 V	
			max.	2.52 V	
003	1	Vehicle speed	Driving1)	...km/h	Speedometer reading and readout on VAG 1551 may differ slightly.
	2	Engine speed	With engine running	rpm	- Perform OBD for relevant engine - Check wiring and connectors according to wiring diagram, including CAN-Bus wiring
Cont'd					

1) When driving, a second technician is needed for reading the specified values.

G00385383

Fig. 68: Test Table (Group 2, Field 4 & Group 3, Fields 1 & 2)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Group No.	Display field	Designation	Test conditions	Specified readout on VAG 1551	Correcting malfunction
003	3	Gear selected	Driving1)		- Check solenoid valves See TRANSMISSION: ELECTRICAL TEST
			Neutral	0	
			Reverse	R	
			1 hydraulic	1	
			1 mechanical	1M	
			2 hydraulic	2H	
			2 mechanical	2M	
			3 hydraulic	3 H	
			3 mechanical	3M	
			4 hydraulic	4H	
			4 mechanical	4M	
	4	Accelerator pedal value	Driving1)		When accelerating from idling to wide open throttle, % figure constantly increases - Initiate basic setting See BASIC SETTING, INITIATING
			Idling	0...1 %	
			Wide open throttle	99...100 %	

1) When driving, a second technician is needed for reading the specified values.

G00385384

Fig. 69: Test Table (Group 3, Fields 3 & 4)

Courtesy of VOLKSWAGEN UNITED STATES, INC.

Reading Measured Value Block; Display Group Number 004; "Checking Solenoid Valves While Driving"

Notes

- The solenoid valves can be checked while driving via "Read measured value block 08"; display group number 004.
- The table shows the solenoid valves -N88-, -N89- and -N90- (displays 1 to 3) as activated in each selector lever position. These solenoid valves control the shift valves for the relevant gears.
- The solenoid valve -N91- activates the lock-up clutch modulation valve and is not covered here.
- The solenoid valves -N92- and -N94- are supplementary valves which affect gear shifts. These valves are only controlled during gear shifts and are displayed in fields 5 and 6. They can show "0" or "1" depending on the driving situation.
- At the start of a test drive the selector lever can be in position "1". During the drive it can be shifted progressively up to position "D".
- The mechanical gear "M" is not always engaged. The control module can engage this gear dependent upon the driving situation. The lock-up clutch can be checked in display group number 005.
- VAG 1551 display field 1 has 6 characters (0000 00) and is read as follows: See **Fig. 70** .

Display on VAG 1551	Display field 1: Display 1	Display 2	Display 3	Display 4	Display 5	Display 6
1551	Solenoid valve 1 -N88-	Solenoid valve 2 -N89-	Solenoid valve 3 -N90-	Solenoid valve 4 -N91- (not applicable)	Solenoid valve 5 -N92-	Solenoid valve 7 -N94-

G00385385

Fig. 70: Identifying VAG 1551 Display Field
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Non-activated solenoid valves display "0" and activated solenoid valves display "1".
- All solenoid valves are checked via On Board Diagnostic (OBD). See **DIAGNOSTIC TROUBLE CODE (DTC) MEMORY, CHECKING** .

Checking Solenoid Valves While Driving

Group No.	Display field	Designation	Test conditions Selector lever in:		Specified readout on VAG 1551	Correcting malfunction
004	1	Solenoid valves/indicated on	**P**		1 0 1 0 00	Solenoid valves are selected according to driving condition
		VAG 1551 display	**R1)**		0 0 1 0 00	- Perform electrical check
			N		1 0 1 0 00	See TRANSMISSION: ELECTRICAL TEST
		-N88- Display 1	D1)	1H	0 0 1 0 00	
		-N89- Display 2		1M	0 0 1 0 00	
		-N90- Display 3		2H	0 1 1 0 00	
		-N91- Display 4		2M	0 1 1 0 00	
		-N92- Display 5		3H	0 0 0 0 00	
		-N94- Display 6		3M	0 0 0 0 00	
				4H	1 1 0 0 01	
continued				4M	1 1 0 0 01	

1) When driving, a second technician is needed for reading the specified values.

G00385386

Fig. 71: Test Table - While Driving (Group 4, Field 1 - 1 Of 2)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Group No.	Display field	Designation	Test conditions Selector lever in:		Specified readout on VAG 1551	Correcting malfunction
004	1	Solenoid valves/indicated on	31)	1H	0 0 1 0 00	Solenoid valves are selected according to driving condition
		VAG 1551:		1M	0 0 1 0 00	- Perform electrical check See TRANSMISSION: ELECTRICAL TEST
		-N88- Display 1		2H	0 1 1 0 00	
		-N89- Display 2		2M	0 1 1 0 00	
		-N90- Display 3		3H	0 0 0 0 00	
		-N91- Display 4		3M	0 0 0 0 00	
		-N92- Display 5	21)	1H	0 0 1 0 00	
		-N94- Display 6		1M	0 0 1 0 00	
				2H	0 1 1 0 00	
				2M	0 1 1 0 00	
			11)	1H	0 0 1 0 00	
				1M	0 0 1 0 00	

1) When driving, a second technician is needed for reading the specified values.

G00385387

Fig. 72: Test Table - While Driving (Group 4, Field 1 - 2 Of 2)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Group No.	Display field	Designation	Test conditions	Specified readout on VAG 1551	Correcting malfunction
004	2	Gear selected	Driving1) Neutral (Park)	0	- Check solenoid valves See TRANSMISSION: ELECTRICAL TEST
			Reverse	R	
			1 hydraulic	1H	
			1 mechanical	1M	
			2 hydraulic	2H	
			2 mechanical	2M	
			3 hydraulic	3 H	
			3 mechanical	3M	
			4 hydraulic	4H	
cont'd			4 mechanical	4M	

1) When driving, a second technician is needed for reading the specified values.

G00385388

Fig. 73: Test Table - While Driving (Group 4, Field 2)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Group No.	Display field	Designation	Test conditions		Specified readout on VAG 1551	Correcting malfunction
004	3	Selector lever position	Driving1)	P	P	- Check and adjust selector lever cable See SERVICING - A/T (01M) article
				R	R	
				N	N	
				D	D	
				3	3	- Check multi-function TR switch See TRANSMISSION: ELECTRICAL TEST
				2	2	
				1	1	
	4	Vehicle speed	Speed at which vehicle is being driven1)		...kph	The speedometer reading and readout on VAG 1551 may differ slightly

1) When driving, a second technician is needed for reading the specified values.

G00385389

Fig. 74: Test Table - While Driving (Group 4, Fields 3 & 4)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Group No.	Display field	Designation	Test conditions	Specified readout on VAG 1551	Correcting malfunction
005	1	ATF temperature; ATF level is checked at approx. 35 C - 45 C	Stationary with engine running. The exact temperature is displayed from approx. 30 C	... C	- Check Transmission Fluid Temperature Sensor -G93- See TRANSMISSION: ELECTRICAL TEST
	2	Shift outputs	Driving1) Ignition timing influence or injection quantity influence (only operative during a gear shift)		- Check wiring and connectors according to wiring diagram, including CAN-Bus wiring - Check engine control module - Replace engine control module if necessary
		Display 12)	is switched on	1	- Replace Transmission Control Module -J217- See COMPONENT LOCATIONS under ELECTRICAL/ELECTRONIC COMPONENTS
			is switched off	0	
		22)	was switched on	1	- Initiate basic setting See BASIC SETTING, INITIATING
cont'd			was switched off	0	

G00385390

Fig. 75: Test Table - While Driving (Group 5, Field 1 & 2 - 1 Of 3)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Group No.	Display field	Designation	Test conditions	Specified read out VAG 1551	Correcting malfunction
005	2	Shift outputs Display 3	Shift Lock Solenoid -N110- is switched on	1	- Check Shift Lock Solenoid -N110- See TRANSMISSION: ELECTRICAL TEST
			is switched off	0	
		4	switched on	1	
			switched off	0	
		5	Cruise control system switched on	1	- Check wiring and connectors according to wiring diagram, including CAN-Bus wiring - Check cruise control system See appropriate WIRING DIAGRAM in ELECTRICAL
cont'd			switched off	0	

G00385391

Fig. 76: Test Table - While driving (Group 5, Field 2 - 2 Of 3)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Group No.	Display field	Designation	Test conditions	Specified readout on VAG 1551	Correcting malfunction
005	2	Shift outputs Display 6	Air conditioner was switched off	1	- Check wiring according to wiring diagram
			was not switched off	0	- Check air conditioner See appropriate MANUAL HVAC SYSTEM article in HVAC
		7	Park/Neutral signal Selector lever in P, N	1	- Check wiring according to wiring diagram
			R	0	
cont'd.			D, 3, 2, 1	1 / 0	Selector lever positions D, 3, 2, 1 not applicable

G00385392

Fig. 77: Test Table - While Driving (Group 5, Field 2 - 3 Of 3)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Group No.	Display field	Designation	Test conditions		Specified readout on VAG 1551	Correcting malfunction
005	3	Gear to be selected	Driving1)	Neutral (Park)	0	- Check solenoid valves See TRANSMISSION: ELECTRICAL TEST
				Reverse	R	
				1 hydraulic	1H	- If gearshifts do not occur, a clutch or brake may be faulty
				1 mechanical	1M	
				2 hydraulic	2H	
				2 mechanical	2M	
				3 hydraulic	3 H	- Replace Transmission Control Module -J217- See COMPONENT LOCATIONS under ELECTRICAL/ELECTRONIC COMPONENTS
				3 mechanical	3M	
				4 hydraulic	4H	
				4 mechanical	4M	

1) When driving, a second technician is needed for reading the specified values.

G00385393

Fig. 78: Test Table - While Driving (Group 5, Field 3)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Group No.	Display field	Designation	Test conditions	Specified readout on VAG 1551	Correcting malfunction
005	4	Engine speed	Driving1) with engine running	rpm	- Perform OBD for relevant engine - Check wiring and connectors according to wiring diagram, including CAN-Bus wiring
006	Not applicable				

1) When driving, a second technician is needed for reading the specified values.

G00385394

Fig. 79: Test Table - While Driving (Group 5, Field 4)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Group No.	Display field	Designation	Test conditions	Specified readout on VAG 1551	Correcting malfunction
007	1	Gear selected1)	Neutral (Park)	0	- Check solenoid valves See TRANSMISSION: ELECTRICAL TEST - If gearshifts do not occur, a clutch or brake may be faulty - Replace Transmission Control Module -J217- See COMPONENT LOCATIONS under ELECTRICAL/ELECTRONIC COMPONENTS
			Reverse	R	
			1 hydraulic	1H +/-	
			1 mechanical	1M +/-	
			2 hydraulic	2H +/-	**Note:** The + (or -) sign relates to the speed information in display field 2.
			2 mechanical	2M +/-	
			3 hydraulic	3 H +/-	
			3 mechanical	3M +/-	
			4 hydraulic	4H +/-	
cont'd			4 mechanical	4M +/-	

1) When driving, a second technician is needed for reading the specified values.

G00385395

Fig. 80: Test Table - While Driving (Group 7, Field 1)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Group No.	Display field	Designation	Test conditions		Specified readout on VAG 1551	Correcting malfunction
007	2	Torque converter lock-up clutch slip with engine running	While driving1)	In the hydraulic gears2)	0 ... stall speed	- Check wiring according to wiring diagram
		Solenoid valve 4 -N91- is activated	Torque converter lock-up clutch closed	Engine speed: 2000...3000 rpm in the mechanical gears3)	0 ... 130 rpm	- Check solenoid valve 4 -N91- See TRANSMISSION: ELECTRICAL TEST - Check transmission Check transmission when clutch slipping or burned See appropriate OVERHAUL article in AUTOMATIC TRANSMISSION - Replace torque converter See REMOVAL & INSTALLATION - A/T(01M) article - Replace valve body See SERVICING - A/T (01M) article

1) When driving, a second technician is needed for reading the specified values.

2) The torque converter lock-up clutch must be open! It is open when in display field 1 "H" = hydraulic with slip is displayed. Additionally the character "+" or "-" is displayed. "+" signifies that the engine speed (pump speed) is greater than turbine speed (vehicle under traction)."-" signifies that the engine speed is less than the turbine speed (vehicle in overrun).

3) The gear shift must be completed. The torque converter lock-up clutch must be closed and the accelerator pedal value held constant (gears will be mechanically activated, "M").

G00385396

Fig. 81: Test Table - While Driving (Group 7, Field 2)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Group No.	Display field	Designation	Test conditions	Specified readout on VAG 1551	Correcting malfunction
007	3	Engine speed	With engine running	... rpm	- If necessary tune engine
	4	Accelerator pedal value	Idling	0...1 %	When accelerating from idling to wide open throttle the percentage value constantly increases
			Wide open throttle	99...100 %	- Initiate basic setting See BASIC SETTING, INITIATING
008	Not applicable				

G00385397

Fig. 82: Test Table - While Driving (Group 7, Fields 3 & 4 & Group 8)

Courtesy of VOLKSWAGEN UNITED STATES, INC.

TRANSMISSION: ELECTRICAL TEST

SPECIAL TOOLS, TESTERS, ETC.

- Digital multimeter, Fluke 83 or equivalent. See **Fig. 83** .
- VAG 1594 A Adapter set. See **Fig. 83** .
- VAG 1598/18 Test box. See **Fig. 83** .

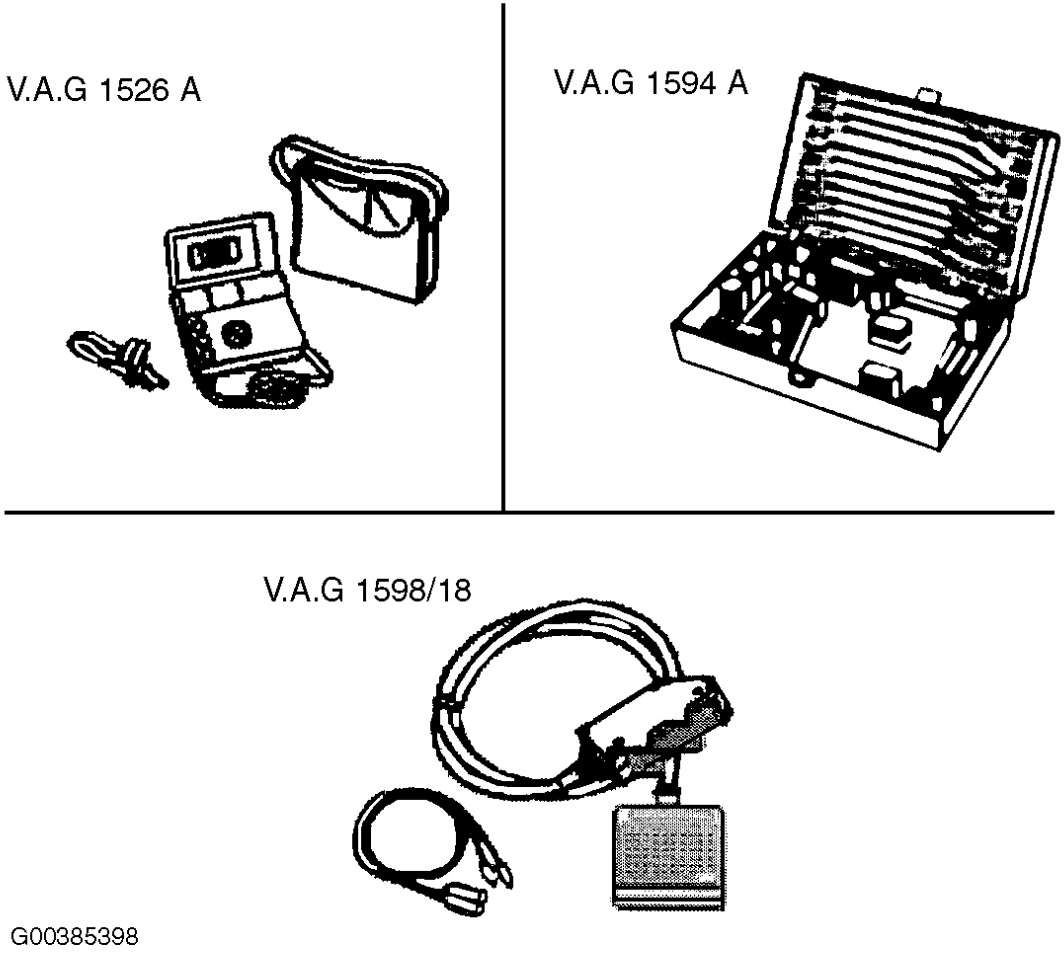


Fig. 83: Identifying Electrical Test Special Tools
Courtesy of VOLKSWAGEN UNITED STATES, INC.

ADDITIONAL INFORMATION REQUIRED

For additional information see appropriate SYSTEM WIRING DIAGRAM article in ELECTRICAL.

TEST REQUIREMENTS

- Battery voltage OK
- Vehicle voltage supply OK
- Fuses No. 7, 11, 15 and 31 OK
- Fuse in main fuse box (110 amps) OK
- Ground connections for transmission OK

NOTE: Ground connection points are located in the plenum chamber and below the battery in the engine compartment. Check battery ground strap and ground strap between battery and transmission. See ELECTRICAL/ELECTRONIC COMPONENTS .

ELECTRICAL TEST

NOTE: This tests for pin voltages on the TCM.

Notes

- For testing use a Fluke 83 multimeter or equivalent with auxiliary wiring from VAG 1594.
- The specified values are valid for an ambient temperature of 0°-40° C (50°-104° F).
- If measured values deviate from the specified values, determine the malfunction using the appropriate wiring diagram.
- If measured values deviate only slightly from the specified values, clean the sockets and connectors of the testers and test leads and repeat the test. Before replacing the particular components, test wiring and connections and, particularly if specified values are below 10 ohms, repeat resistance measurement on component.
- Before replacing components, check the respective wiring and connectors. Repeat resistance tests when values are below 10 ohms.

Testing

1. Switch off ignition.
2. Slide plenum chamber center cover -1- forward out of its locking device and take off of dash panel -arrow-. See **Fig. 8** .
3. Remove screws -1- (Qty. 3). See **Fig. 9** .
4. Lift left-hand plenum chamber cover -1- in the center of the instrument panel -arrow A-, this action unclips the panel (front and rear edges are clipped). See **Fig. 10** .
5. Pull cover -1- toward center of instrument panel and out of retainers in A-pillar -arrow B-. See **Fig. 10** .
6. Lift right-hand plenum chamber cover -1- in the center of the instrument panel -arrow A-, this action unclips the panel (front and rear edges are clipped). See **Fig. 29** .

7. Pull cover -1- toward center of instrument panel and out of retainers in A-pillar -arrow B-. See **Fig. 29** .
8. Remove securing screws from the right-hand sealing part -1- or the left-hand sealing part -2- and take sealing part off plenum chamber upward. See **Fig. 30** .
9. Release multi-pin connector, then disconnect connector from control module. See **Fig. 31** .

NOTE: In order to avoid interference with electronic components, switch to the correct test range on the multimeter before connecting the test leads.

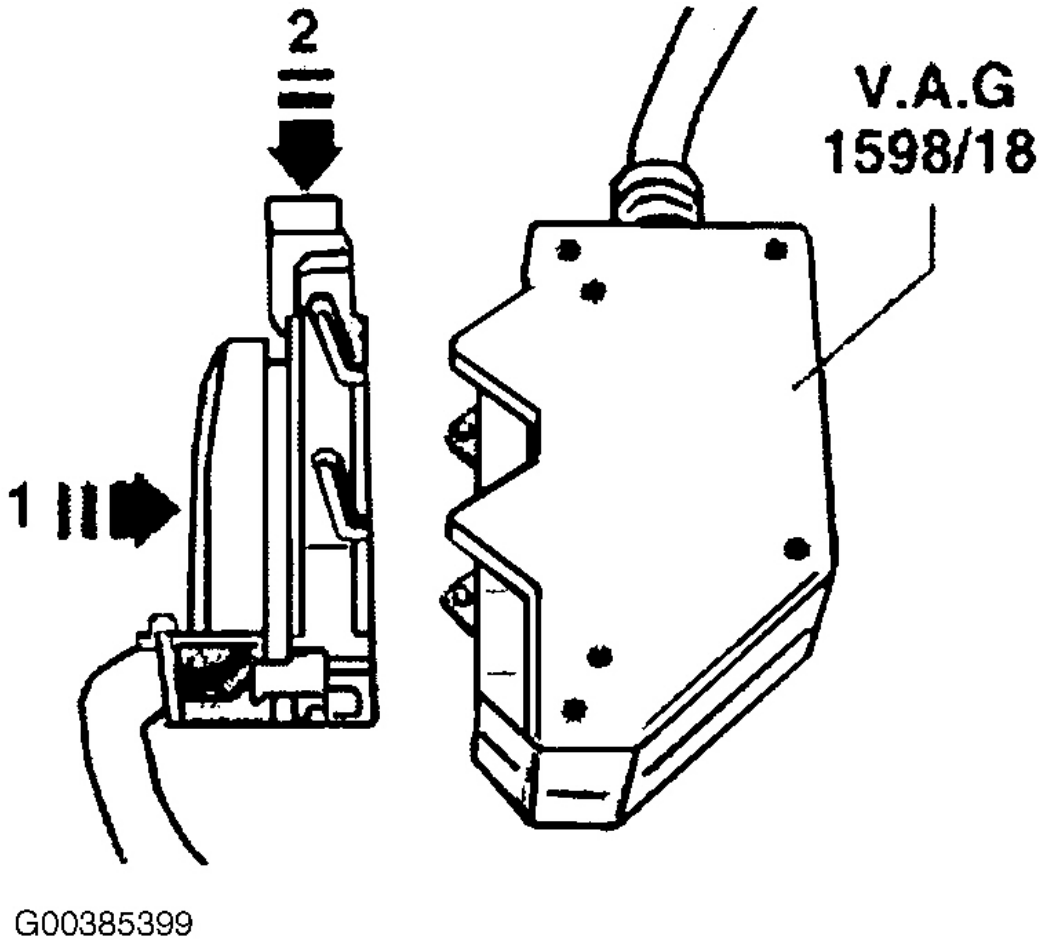


Fig. 84: Connecting VAG 1598/18 Test Box
Courtesy of VOLKSWAGEN UNITED STATES, INC.

10. Connect VAG 1598/18 test box to multi-pin connector -1- and lock in direction of arrow -2-. See **Fig. 84** . Using the VAG 1598/18 test box the wiring can be checked according to the wiring diagram.
11. After electrical tests:

- Connect multi-pin connector on Transmission Control Module -J217- pins (arrows) then lock connector. See **Fig. 33** .
- Conducting On Board Diagnostic (OBD). See **ON BOARD DIAGNOSTIC (OBD), CONDUCTING** .
- Initiating basic setting. See **BASIC SETTING, INITIATING** .

Transmission Control Module (TCM) -J217- 68-Pin Connector (Socket Numbers On VAG 1598/18)

1- Ground (terminal 31)	20- Vehicle Speed Sensor -G68-
2- Vacant	21- Transmission Vehicle Speed Sensor -G38-
3- CAN-Bus low input and output signals	22- Solenoid valve 6 -N93- supply voltage
4- Vacant	23- Supply voltage (terminal 15)
5- Vacant	24- On Board Diagnostic K-wire
6- Transmission Fluid Temperature Sensor -G93-	25- CAN-Bus high input and output signals
7- Vacant	26- CAN-Bus shield, vacant if CAN-Bus wiring has interwoven core
8- Vacant	27- Vacant
9- Solenoid valve 3 -N90-	28- Vacant
10- Solenoid valve 7 -N94-	29- Shift Lock Solenoid -N110-
11- Park/neutral signal	30- Vacant
12- Kickdown for air conditioner	31- Vacant
13- Vacant	32- Vacant
14- Vacant	33- Vacant
15- Brake Light Switch -F- signal voltage	34- Vacant
16- Kick Down Switch -F8-	35- Vacant
17- Vacant	36- Vacant
18- Multi-Function TR Switch -F125- (pin 5)	37- Vacant
19- Vacant	38- Vacant

G00385400

Fig. 85: Transmission Control Module Pin Numbers (1-38)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

39- Vacant	54- Solenoid valve 2 -N89-
40- Multi-Function TR Switch -F125- (pin 2)	55- Solenoid valve 1 -N88-
41- Vacant	56- Solenoid valve 5 -N92-
42- Vacant	57- Selector lever display
43- Vehicle Speed Sensor -G68- (shield)	58- Solenoid valve 6 -N93-
44- Transmission Vehicle Speed Sensor -G38- (shield)	59- Vacant
45- Supply voltage (terminal 30)	60- Vacant
46- Vacant	61- Cruise control system (output)
47- Solenoid valve 4 -N91-	62- Multi-Function Switch -F125- (pin 6)
48- Vacant	63- Multi-Function Switch -F125-
49- Vacant	64- Vacant
50- Vacant	65- Vehicle Speed Sensor -G68-
51- Vacant	66- Transmission Vehicle Speed Sensor -G38-
52- Vacant	67- Solenoid valves voltage supply
53- Vacant	68- Vacant

G00385401

Fig. 86: Transmission Control Module Pin Numbers (39-6)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Overview Of Test Steps

- Conduct only those test steps recommended in the Diagnostic Trouble Code (DTC) and measured value block tables.
- Steps listed below according to component. See **Fig. 87** .

Component checked	Test steps to be conducted	Component checked	Test steps to be conducted
Supply voltage to TCM -J217-	1	Kick-Down Switch -F8-	10
Brake Light Switch -F-	2	Shift Lock Solenoid -N110-	11
Solenoid valve 1 -N88-	3	Transmission Fluid Temperature Sensor -G93-	12
Solenoid valve 2 -N89-	4	Vehicle Speed Sensor -G68-	13
Solenoid valve 3 -N90	5	Transmission Fluid Temperature Sensor -G93-	14
Solenoid valve 4 -N91-	6	Multi-Function TR Switch -F125-	15
Solenoid valve 5 -N92-	7		
Solenoid valve 6 -N93-	8		
Solenoid valve 7 -N94-	9		

G00385402

Fig. 87: Identifying Test Table Example
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Test Table (Electrical)

Switch to voltage measuring range 20 V					
Test step	**VAG 1598/18 sockets**	**Test description**	• Test conditions - Additional operations	**Specified value**	**Corrective action**
1	23 + 1	Supply voltage from TCM -J217-	• Ignition switched on	approx. battery voltage (B+)	- Check wiring according to wiring diagram - Check wire from terminal 1 to Ground - Check wire from terminal 23 to terminal 15 (fuse No. 31)
	45 +1				- Check wire from terminal 45 to terminal 30 (fuse No. 15)
2	15 + 1	Brake Light Switch -F-	• Ignition switched on • Brake pedal not depressed	Less than 1V	- Check wiring according to wiring diagram
			- Brake pedal depressed	approx. battery voltage	- Replace Brake Light Switch -F- and adjust

G00385403

Fig. 88: Electrical Test Table (Steps 1 & 2)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Switch to resistance measuring range 200 Ohms					
Test step	**VAG 1598/18 sockets**	**Test description**	• Test conditions - Additional operations	**Specified value**	**Corrective action**
3	55 + 67	Solenoid valve 1	• Ignition switched off	55 to 65 ohms	
	55 + 1 67 + 1	-N88-	• Ignition switched off - Switch multimeter to greatest ohms range	infinite ohms	- Check wiring according to wiring diagram
4	54 + 67	Solenoid valve 2	• Ignition switched off	55 to 65 ohms	
	54 + 1 67 + 1	-N89-	• Ignition switched off - Switch multimeter to greatest ohms range	infinite ohms	- Check conductor strip according to wiring diagram
5	9 + 67	Solenoid valve 3	• Ignition switched off	55 to 65 ohms	- Replace conductor strip
	9 + 1 67 + 1	-N90-	• Ignition switched off - Switch multimeter to greatest ohms range	infinite ohms	See COMPONENT LOCATIONS under ELECTRICAL/ ELECTRONIC COMPONENT
6	47 + 67	Solenoid valve 4	• Ignition switched off	4.5 to 6.5 ohms	- Replace valve body
	47 + 1 67 + 1	-N91-	• Ignition switched off - Switch multimeter to greatest ohms range	infinite ohms	See SERVICING - A/T (01M) article

G00385404

Fig. 89: Electrical Test Table (Step 3, 4, 5 & 6)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Switch to resistance measuring range 200 Ohms					
Test step	**VAG 1598/18 sockets**	**Test description**	• Test conditions - Additional operations	**Specified value**	**Corrective action**
7	56 + 67	Solenoid valve 5	• Ignition switched off	55 to 65 ohms	
	56 + 1 67 + 1	-N92-	• Ignition switched off - Switch multimeter to greatest ohms range	infinite ohms	- Check wiring according to wiring diagram
8	58 + 22	Solenoid valve 6 -N93-	• Ignition switched off	4.5 to 6.5 ohms	- Check conductor strip according to wiring diagram
	58 + 1 22 + 1		• Ignition switched off - Switch multimeter to greatest ohms range	infinite ohms	- Replace conductor strip See COMPONENT LOCATIONS under ELECTRICAL/ ELECTRONIC COMPONENTS
9	10 + 67	Solenoid valve 7	• Ignition switched off	55 to 65 ohms	- Replace valve body
	10 + 1 67 + 1	-N94-	• Ignition switched off - Switch multimeter to greatest ohms range	infinite ohms	See SERVICING - A/T (01M) article

G00385405

Fig. 90: Electrical Test Table (Steps 7, 8 & 9)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Switch to resistance measuring range 200 Ohms					
Test step	**VAG 1598/18 sockets**	**Test description**	• Test conditions - Additional operations	**Specified value**	**Corrective action**
10	1 + 16	Kick Down Switch -F8- (can only be checked when switch is part of accelerator cable)	• Ignition switched off - Switch multimeter to greatest ohms range • Accelerator pedal not depressed	infinite ohms	- Check wiring according to wiring diagram - Disconnect connector from switch, repeat measurement on switch
			- Switch multimeter to 200 ohms range - Depress accelerator as far as kickdown	less than 1.5 ohms	- Adjust accelerator cable or replace See Removing & Installing (2.0L, Engine Code AEG) under Kickdown Switch -F8- under COMPONENT LOCATIONS under ELECTRICAL/ ELECTRONIC COMPONENTS
11	23 + 29	Shift Lock Solenoid -N110-	• Ignition switched off	12 to 15 ohms	- Disconnect selector lever light, repeat measurement - Check wiring according to wiring diagram - Replace Shift Lock Solenoid -N110- See SERVICING – A/T (01M) article

G00385406

Fig. 91: Electrical Test Table (Steps 10 & 11)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Switch to resistance measuring range 2 M Ohms					
Test step	**VAG 1598/18 sockets**	**Test description**	• Test conditions - Additional operations	**Specified value**	**Corrective action**
12	6 + 67	Transmission Fluid Temperature Sensor -G93-	• Ignition switched off		- Check wiring according to wiring diagram - See Conductor Strip With Integrated Transmission Fluid Temperature Sensor -G93- under COMPONENT LOCATIONS under ELECTRICAL/ ELECTRONIC COMPONENTS
			• ATF temperature		
			approx. 20° C	0.247 M ohms	
			- Switch multimeter to 200 K ohms		
			approx. 60° C	48.8 K ohms	
			approx. 120° C	7.4 K ohms	

G00385407

Fig. 92: Electrical Test Table (Step 12)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

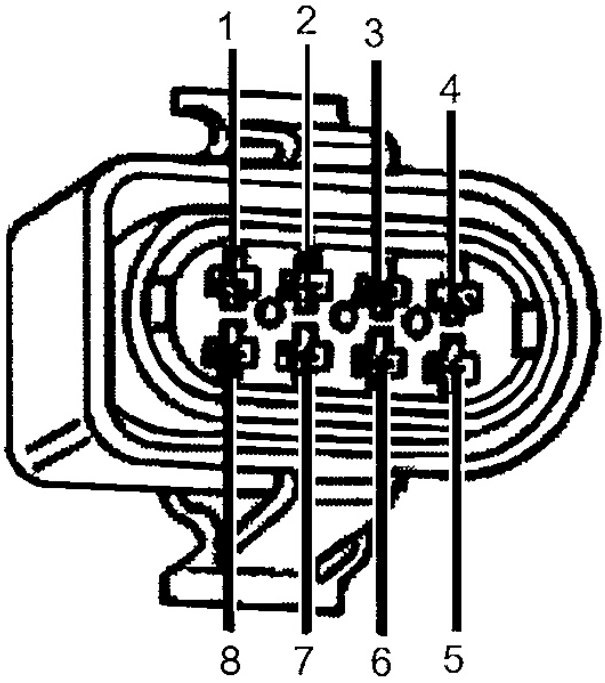
Switch to resistance measuring range 20 K ohms					
Test step	**VAG 1598/18 sockets**	**Test description**	• Test conditions - Additional operations	**Specified value**	**Corrective action**
13	20 + 65	Vehicle Speed Sensor -G68-	• Ignition switched off		- Disconnect sensor, repeat measurement on sensor See Vehicle Speed Sensor (VSS) -G68- under COMPONENT LOCATIONS under ELECTRICAL/ ELECTRONIC COMPONENTS - Check wiring from TCM to sensor according to wiring diagram
				min. 0.8 K ohms	
				max. 0.9 K ohms	
14	21 + 66	Transmission Vehicle Speed Sensor -G38-	• Ignition switched off		- Disconnect sensor, repeat measurement on sensor. See transmission Vehicle Speed Sensor -G38- under COMPONENT LOCATIONS under ELECTRICAL/ ELECTRONIC COMPONENTS - Check wiring from TCM to sensor according to wiring diagram - Replace Transmission Vehicle Speed Sensor -G38- See transmission Vehicle Speed Sensor -G38- under COMPONENT LOCATIONS under ELECTRICAL/ ELECTRONIC COMPONENTS
				min. 0.8 K ohms	
				max. 0.9 K ohms	

G00385408

Fig. 93: Electrical Test Table (Steps 13 & 14)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Test Step 15: Multi-Function Transmission Range (TR) Switch -F125-

Disconnect connector from multi-function TR switch. See **Fig. 94** .



Connector pin assignment

1 - To Pin 63 of TCM connector

2 - To Pin 40 of TCM connector

3 - To pin Pin 1 of TCM connector (Ground)

4 - Vacant

5 - To Pin 18 of TCM connector

6 - To Pin 62 of TCM connector

7 - To Pin 23 of TCM connector
(voltage supply terminal 15)

G00385409

Fig. 94: Transmission Range Switch Connector Pin Assignment
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Checking Supply Voltage

1. Connect VAG 1598/18 test box.
2. Switch multimeter to 20 V measuring range.
3. Switch ignition on.
4. Measure between terminal 7 and terminal 3 (Ground) on disconnected multi-function TR switch connector. See **Fig. 94** . Specification: Battery voltage.
5. Measure from terminal 7 of connector to socket 1 on 1598/18 (Ground).
6. Measure from socket 23 (terminal 15) on 1598/18 to socket 1 on 1598/18 (Ground). Specification: Battery voltage.
7. If the specifications are not obtained: Repair wiring according to wiring diagram.
8. If the specifications are obtained: Check wiring further.
9. Switch ignition off.
10. Remove relay for Park/Neutral Position (PNP) Relay -J226-.
11. Set multimeter to 200 ohms resistance measuring range.
12. Check the wiring between the multi-pin connector on the TCM and the connector on the multi-function TR switch.
13. Measure between sockets 1 and 18 on VAG 1598/18. Specification: Infinity ohms.
14. Measure between sockets 23 and 18 on VAG 1598/18. Specification: Infinity ohms.
15. Measure between socket 18 on VAG 1598/18 and terminal 5 on connector. See **Fig. 94** . Specification: Less than 1.5 ohms.
16. If the specifications are not obtained: Repair wiring using wiring diagram.
17. If the specifications are obtained: Check wiring further.
18. Measure between sockets 1 and 63 on VAG 1598/18. Specification: Infinity ohms.
19. Measure between sockets 23 and 63 on VAG 1598/18. Specification: Infinity ohms.
20. Measure between socket 63 on VAG 1598/18 and terminal 1 on connector. See **Fig. 94** . Specification: Less than 1.5 ohms.
21. If the specifications are not obtained: Repair wiring according to the wiring diagram.
22. If the specifications are obtained: Check wiring further.
23. Measure between sockets 1 and 62 on VAG 1598/18. Specification: Infinity ohms.
24. Measure between sockets 23 and 62 on VAG 1598/18. Specification: Infinity ohms.
25. Measure between socket 62 on VAG 1598/18 and terminal 6 on connector. See **Fig. 94** . Specification: Less than 1.5 ohms.
26. If the specifications are not obtained: Repair wiring using wiring diagram.
27. If the specifications are obtained: Check wiring further.
28. Measure between sockets 1 and 40 on VAG 1598/18. Specification: Infinity ohms.
29. Measure between sockets 23 and 40 on VAG 1598/18. Specification: Infinity ohms.
30. Measure between socket 40 on VAG 1598/18 and terminal 2 on connector. See **Fig. 94** . Specification: Less than 1.5 ohms

31. If the specifications are not obtained: Repair wiring using wiring diagram.
32. If the specifications are obtained: Replace multi-function TR switch. See **Multi-Function Transmission Range (TR) Switch -F125-** under COMPONENT LOCATION under ELECTRICAL/ELECTRONIC COMPONENTS.
33. Install Park/Neutral Position (PNP) Relay -J226-.

DEFINITIONS

The following section refers only to the automatic transmission 01M and to related terms that may be found in the 01M On Board Diagnostic (OBD) section. These definitions are not necessarily generally valid. For further information about these subjects, see Self-Study Program, The New Beetle.

ABS

Anti-lock brake system.

DISPLAY GROUP NUMBER

See **MEASURED VALUE BLOCK, READING** under ON BOARD DIAGNOSTIC (OBD), CONDUCTING.

THROTTLE VALVE CONTROL MODULE

An engine component to stabilize the idling speed. The "Throttle valve signal" originates here. Further information on the throttle valve control module can be found in Self-Study Program No.413, On Board Diagnostic II.

ON BOARD DIAGNOSTIC (OBD)

The capability of a control module to recognize, react to and store malfunctions of various components and systems.

CONDUCTING ON BOARD DIAGNOSTIC (OBD)

Connecting a scan tool and checking the Diagnostic Trouble Code (DTC) memory. The malfunctions registered and stored by a control module are read by using the scan tool.

INJECTION QUANTITY INFLUENCE

The engine torque is reduced during the gear shift process by changing the quantity of injected fuel.

ELECTRICAL TEST

By performing certain measurements a targeted check of the electronic components is accomplished.

FUZZY-LOGIC

Type of monitoring for the actual driving situation. This software in the control module replaces the previous program switch.

CAN-BUS

Method of data transport. Electrical signals are carried in a certain format (BUS).

CAN-BUS LOW (HIGH)

The voltage used to transport the data is low (high).

TRANSMISSION VEHICLE SPEED SENSOR -G38-

The sensor records the speed of the large sun wheel in the planetary gearset and transmits it to the transmission control module.

VEHICLE SPEED SENSOR -G68-

The sensor records the speed of the output gear and transmits it to the transmission control module (not to the speedometer).

INITIATING BASIC SETTING

The values learned in the control module are returned to the initial values.

"NO COMMUNICATION"

There is no connection for exchanging information between the control modules.

SHORT TO GROUND

Current flows (incorrectly) to Ground without supplying a consumer.

SHORT TO POSITIVE

Current flows (incorrectly) to a live component without supplying a consumer.

READ MEASURED VALUE BLOCK

The control module can transfer a considerable amount of test data. This test data contains information on the operational condition of the system and sensors connected to it. The transferred test data can support diagnosis and malfunction correction. The test data has been summarized into single display groups due to the amount of information available for evaluation.

EMERGENCY RUNNING

A condition of the control module. When certain malfunctions are recognized it protects the transmission against damage, which guarantees the vehicle may be safely driven further. During emergency running mode the driving characteristics of the transmission are impaired only as much as is necessary.

PENDULUM SUPPORT

Designation for the type of assembly (engine/transmission) mounting.

SPORADIC

Happens occasionally.

TDC SIGNAL

This signal is used to calculate the engine speed.

INFINITY OHMS

The resistance is high, an open circuit is indicated.

IGNITION TIMING INFLUENCE

The engine torque is reduced during the gear shift process by changing the ignition timing.

APPLICATION

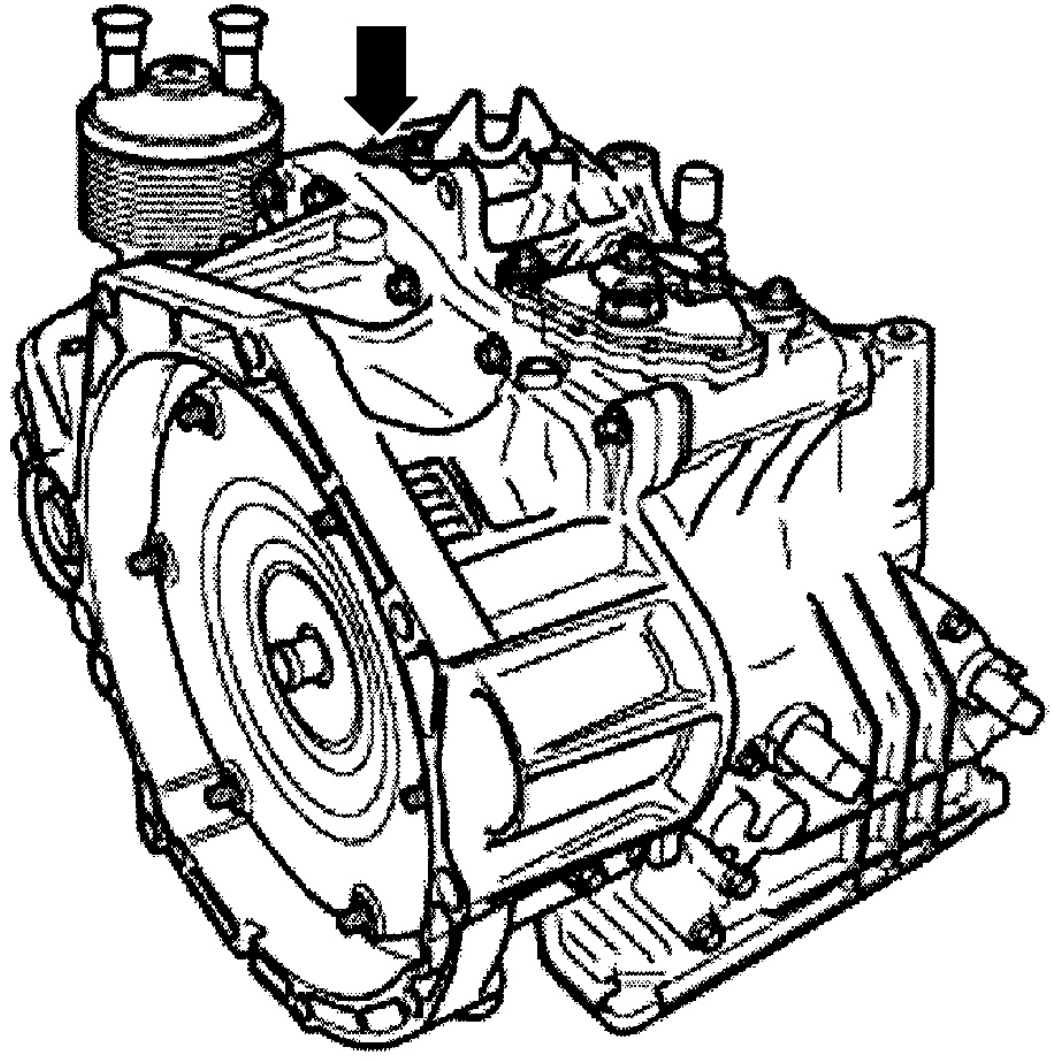
TRANSMISSION APPLICATION

Application	Transmission Model
1.8L (2002-2004)	09G, 6-Speed
2.0L (2003-2004)	09G, 6-Speed

IDENTIFICATION

IDENTIFICATION CODE

Transmission code letters are given on type plate (arrow). See **Fig. 1** . Transmission code letters are also given on vehicle data plate.



G00380844

Fig. 1: Locating Transmission Identification Code
Courtesy of VOLKSWAGEN UNITED STATES, INC.

ON BOARD DIAGNOSTIC (OBD), FUNCTION

The automatic transmission is controlled electro-hydraulically. On Board Diagnostic (OBD) or "self-diagnosis" is specifically for the electronic/electric control of the transmission.

FUNCTIONS OF TRANSMISSION CONTROL MODULE

The control module receives information from components that effect selection of gears and passes the

information on to solenoid valves that control the valves in the valve body.

In the dynamic shift program the control module adapts itself to the existing driving resistance (e.g. gradients, trailer) as well as to the driver`s driving style (e.g. sporty driving style) and selects the corresponding shift points.

The control module is equipped with a Diagnostic Trouble Code (DTC) memory so that in the event of an electronic/electrical component failure or on open circuit the DTC can be determined quickly. DTCs are recognized by electrical signals and stored in the DTC memory.

TRANSMISSION CONTROL MODULE FAULT RECOGNITION

The control module detects malfunctions while driving and stores them in the DTC memory DTC table. See **DIAGNOSTIC TROUBLE CODE (DTC) TABLE** . This information is also kept when there is no battery voltage.

The control module distinguishes between permanent and sporadic malfunctions. If the malfunction does not occur within a predetermined time or distance again, the fault is stored as a sporadic malfunction.

A malfunction also becomes a sporadic malfunction when the DTC memory has not been erased after a repair.

DTCs which are stored in the memory as sporadically occurring, will be displayed as "sporadic faults" when retrieved by the VAS 5051 tester. "SP" appears on the right of the display in such cases. If the printer is switched on, "sporadic faults" are printed out after the fault is addressed.

If the malfunction does not occur within a predetermined time or distance again the DTC is erased in the memory.

SAFETY FUNCTIONS OF TRANSMISSION CONTROL MODULE

If malfunctions occur when driving, the control module can activate functions or emergency running modes. These could have effects on the gear function and quality.

All segments of the selector lever position display in the instrument cluster will light-up when the control module is functioning and when the transmission is in emergency running mode. See **Fig. 2** .

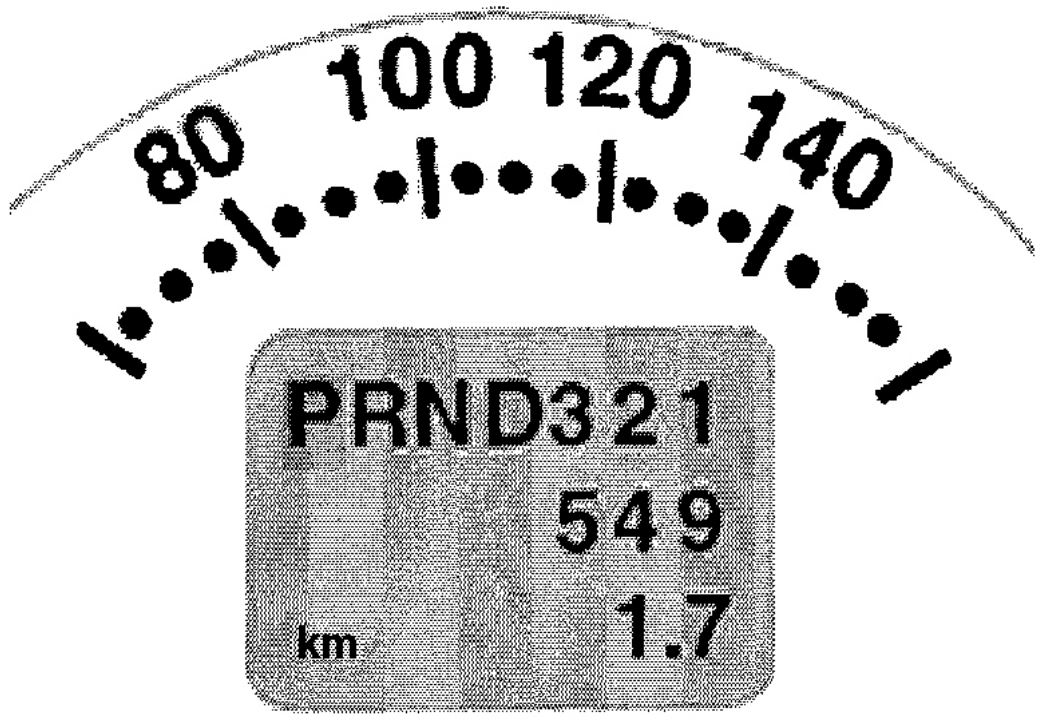


Fig. 2: Identifying Selector Lever Position Display
Courtesy of VOLKSWAGEN UNITED STATES, INC.

The selector lever position display will show nothing when the control module is faulty and the transmission is in emergency running mode.

The transmission will remain in emergency running mode; until the fault is no longer recognized by the control module over a predetermined period.

TECHNICAL DATA OF ON BOARD DIAGNOSTIC (OBD)

Memory	
♦ Permanent memory	yes
Data output	
♦ Rapid data transfer	yes
Final control diagnosis / Output Diagnostic Test Mode (DTM)	no
Basic setting	yes
Code control module	no
Read measured value (data) block	yes

G00385411

Fig. 3: Technical Data Of On Board Diagnostic
Courtesy of VOLKSWAGEN UNITED STATES, INC.

GENERAL NOTES ON REPAIR

To repair the transmission perfectly and successfully the greatest care and levels of cleanliness must be used. The tools must also be in perfect condition. When performing a repair the general safety rules must be kept in mind.

A number of generally applicable instructions for individual repair operations, which are otherwise mentioned at various points in the repair manual; are summarized here.

BATTERY DISCONNECTING & RECONNECTING

CAUTION: Before beginning repairs on the electrical system:

- **Obtain anti-theft radio security code.**
- **Switch off all electrical consumers.**
- **Switch ignition off and remove ignition key.**

- **Do not loosen or remove ground strap from body. Disconnect terminal from battery only.**

For work steps required after reconnecting battery, see **Fig. 4** .

Work steps	completed?
Diagnostic Trouble Code (DTC) Memory: Check using VAS 5051 Tester in mode "Guided Fault Finding".	
Power windows (where applicable): Completely open and close all power windows.	
Radio: Input anti-theft radio code and check radio, CD & tape player functions as applicable.	
Clock: Check and reset to local time.	
All electrical consumers: Check function.	

G00387816

Fig. 4: Reconnecting Battery Work Steps
Courtesy of VOLKSWAGEN UNITED STATES, INC.

NOTE: **If desired, print this page and use the table above as a checklist.**

TRANSMISSION

When an automatic transmission is replaced the following fluid levels must be checked:

- ATF in planetary gearbox and final drive. See **SERVICING - A/T (09G)** article.
- Filling level and specification. See **SERVICING - A/T (09G)** article.

- Do not run the engine or tow a vehicle with the transmission oil pan removed or when there is no ATF in transmission.
- Secure torque converter to prevent it falling out when the transmission is removed.
- Clean joints and connecting points thoroughly before loosening.
- When installing the transmission ensure that the dowel sleeves between the engine and the transmission are seated correctly.
- Place parts that have been removed on a clean surface and cover so that they are not soiled. Use foil and paper. Do not use fluffy cloths!
- Only install clean components: Only unpack replacement parts immediately prior to installation.
- Carefully cover opened components or seal them if the repair cannot be performed immediately.
- Replace the transmission if any of the selector elements are scorched or burned.
- A basic (default) setting must be performed each time the transmission is reinstalled.

GASKETS, SEALS

- Always replace O-rings, seals and gaskets.
- After removing seals/gaskets etc. always check the contact surfaces on housings or shafts for burrs and damage and correct before reinstalling.
- The open side of an oil seal faces toward the oil.
- Before installing an oil seal moisten the outer surfaces and the sealing lip sparingly with ATF.
- Moisten O-rings with ATF to prevent damage to the O-ring when installing.
- Only use ATF in the areas of the ATF. Other lubricants will cause the hydraulic elements to malfunction.
- After installing, check ATF level in planetary gearbox/final drive and correct levels as necessary.
    a. ATF in planetary gearbox and final drive. See **SERVICING - A/T (09G)** article.
    b. Filling level and specification. See **SERVICING - A/T (09G)** article.

NUTS, BOLTS/SCREWS

- Loosen and tighten the nuts, bolts/screws for securing the covers and housings in a diagonal sequence.
- Do not cant particularly sensitive parts, e.g. valve body, and loosen and tighten in stages using diagonal sequence.
- The torque settings indicated refer to the non-lubricated screws and bolts.
- Threads of bolts/screws that are secured by locking fluid are to be cleaned with a wire brush. Then insert bolts/screws with AMV 185 100 A1.

- All threaded holes where locking fluid is employed must be cleaned with a thread tap to remove remnants of locking fluid. Otherwise there is a danger that a bolt/screw will shear when reinstalling.
- Always replace self-locking nuts and bolts/screws.

VALVE BODY

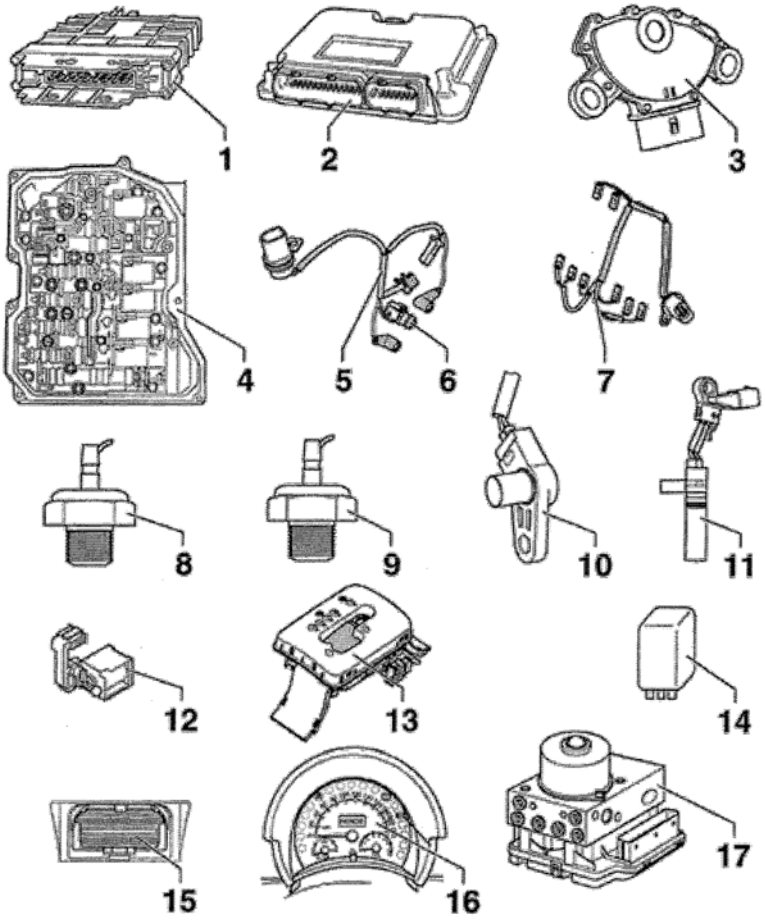
The valve body is allocated according to the transmission code. Check with local parts distributor for appropriate application.

GUIDED FAULT FINDING, VEHICLE SELF-DIAGNOSIS AND MEASURING TECHNOLOGY

Before servicing the automatic transmission, determine the cause of the malfunction as precisely as possible with the Vehicle Diagnosis, Test and Information System VAS 5051 and with the aid of "Guided fault finding", "Vehicle self-diagnosis" and "Measuring technology".

ELECTRICAL/ELECTRONIC COMPONENT LOCATIONS

COMPONENT IDENTIFICATION



1. Automatic Transmission Control Module (TCM) -J217-
2. Engine Control Module (ECM)
3. Multi-Function Transmission Range (TR) Switch -F125-
4. Valve
5. Wiring Harness, 8-pin
6. Transmission Fluid Temperature Sensor -G93-
7. Wiring Harness, 14-pin
8. Sender -1- For Hydraulic Pressure -G193-
9. Sender -2- For Hydraulic Pressure Sensor -G194-
10. Sensor For Transmission RPM -G182-
11. Sender For Transmission Output RPM -G195-
12. Shift Lock Solenoid -N110-
13. Tiptronic Switch -F189-
14. Starting Interlock Relay -J207-
15. Data Link Connector (DLC)
16. Transmission Range (TR) Selector Lever Display -Y6-
17. ABS Control Module

G00385413

Fig. 5: Identifying Electrical/Electronic Components
Courtesy of VOLKSWAGEN UNITED STATES, INC.

MULTI-FUNCTION TR SWITCH -F125-

Location: on front left side of transmission.

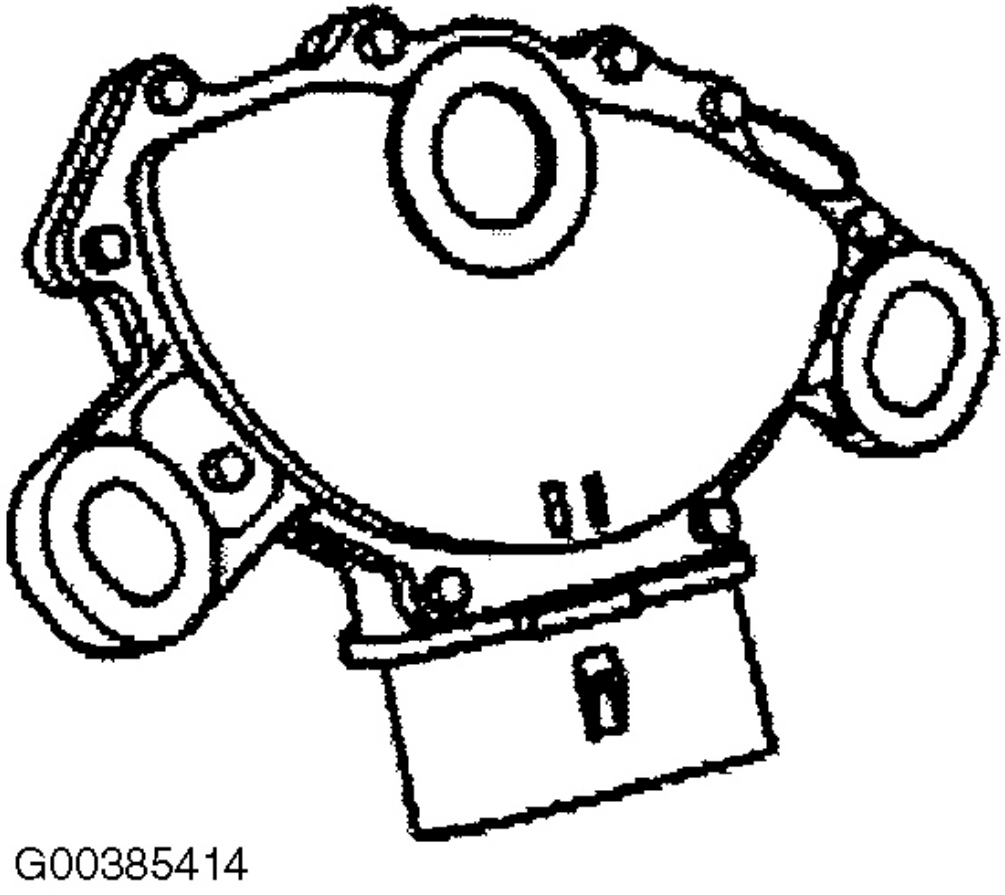


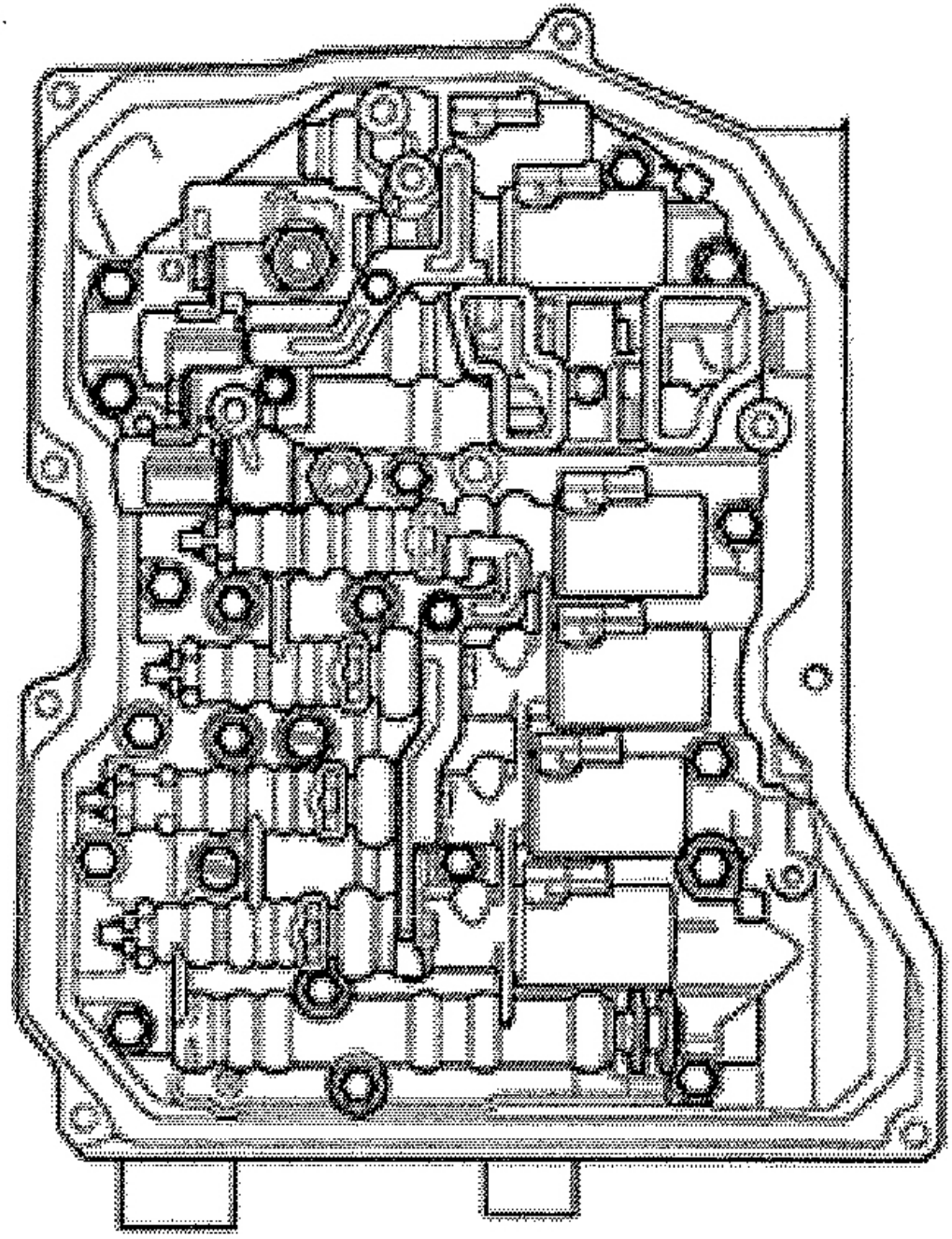
Fig. 6: Identifying Multi-Function TR Switch -F125-
Courtesy of VOLKSWAGEN UNITED STATES, INC.

VALVE BODY

Location: bolted to underside of transmission and covered by oil pan.

The following are secured to the valve body:

- Solenoid valves -N88- and -N89-
- Pressure regulating valves -N90-, -N91-, -N92-, -N93-, -N282- and -N283-



G00385415

Fig. 7: Identifying Valve Body

Courtesy of VOLKSWAGEN UNITED STATES, INC.

WIRING HARNESS, 8-PIN

Location: secured to valve body and transmission.

- With integrated Transmission fluid temperature sensor -G93- (arrow). See **Fig. 8** .
- Sensor wiring harness

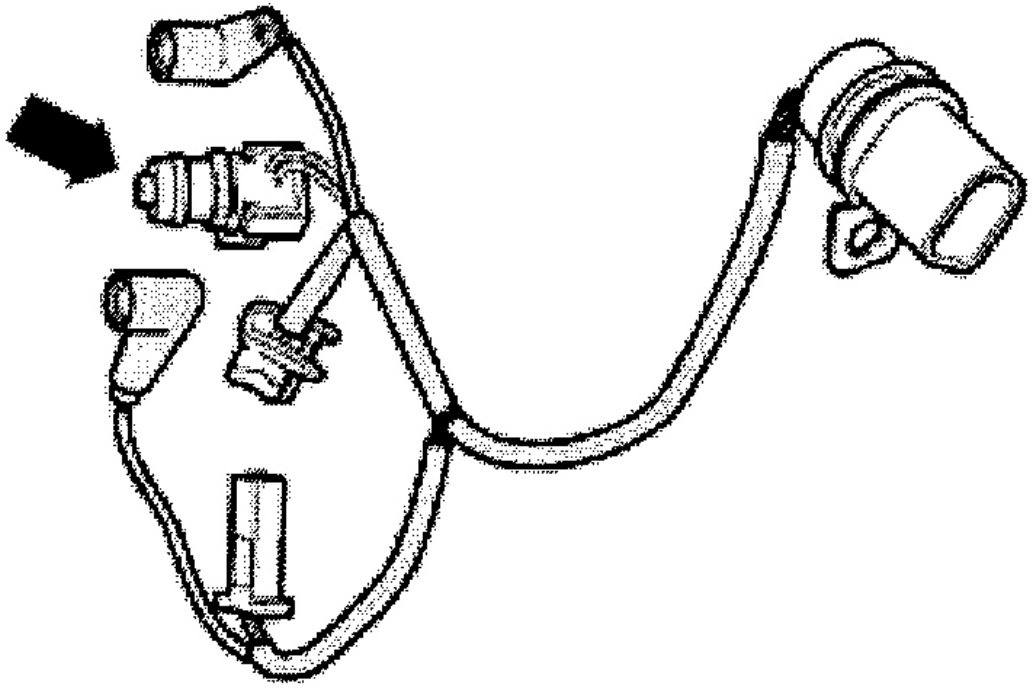


Fig. 8: Identifying Wiring Harness, 8-Pin
Courtesy of VOLKSWAGEN UNITED STATES, INC.

WIRING HARNESS, 14-PIN

Location: secured to valve body and transmission.

Solenoid valves wiring harness

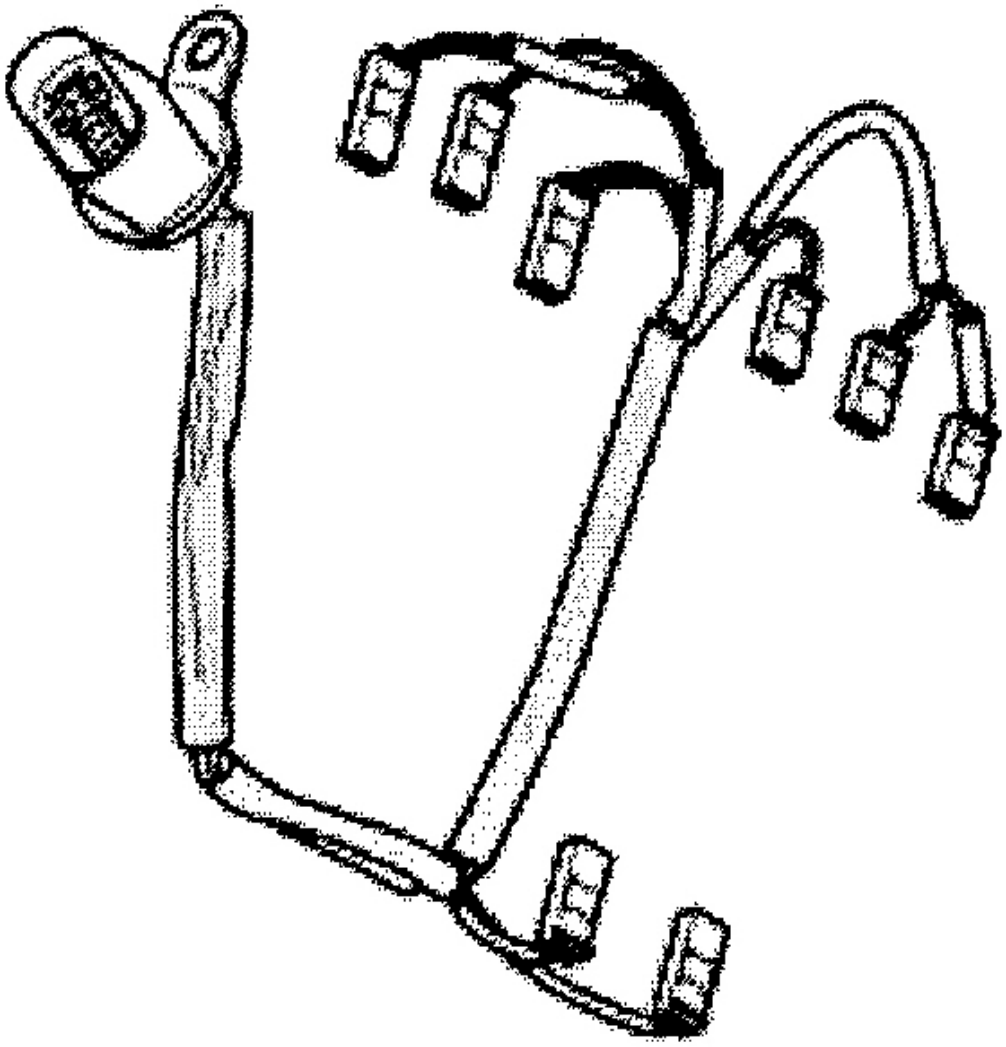


Fig. 9: Identifying Wiring Harness, 14-Pin
Courtesy of VOLKSWAGEN UNITED STATES, INC.

SENDER -1- FOR HYDRAULIC PRESSURE -G193- AND SENDER -2- FOR HYDRAULIC PRESSURE -G194-

Location: in valve body.

Sender -1- for hydraulic pressure -G193-. See **Fig. 10** . Sender -2- for hydraulic pressure -G194-.

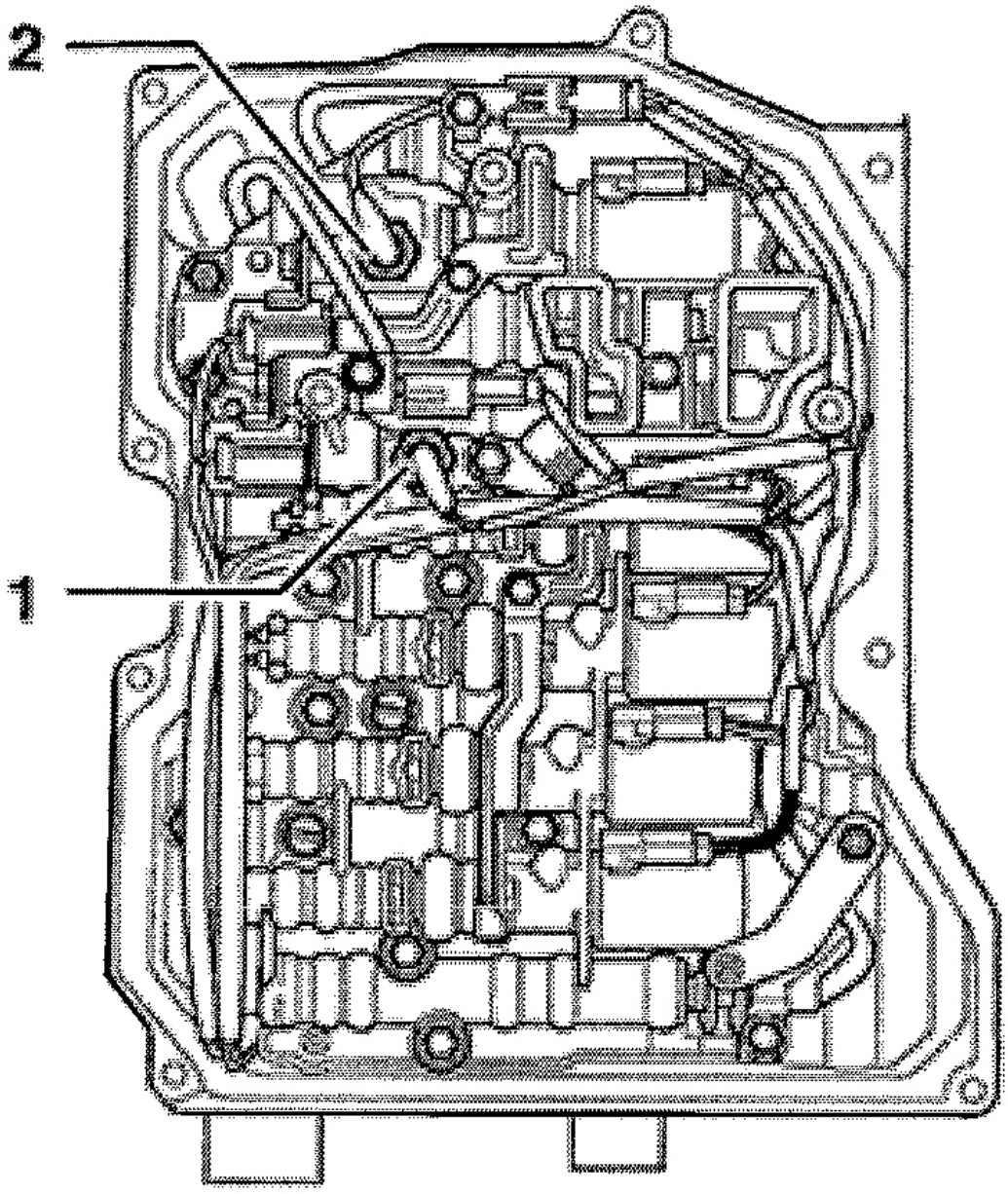


Fig. 10: Identifying Sender 1 & 2 For Hydraulic Pressure (G193 & G194)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

SENSOR FOR TRANSMISSION RPM -G182- AND SENDER FOR TRANSMISSION OUTPUT RPM -G195-

Location: in transmission housing above valve body.

Sensor -1- for transmission RPM -G182-. See **Fig. 11** . Sender -2- for transmission output RPM -G195-

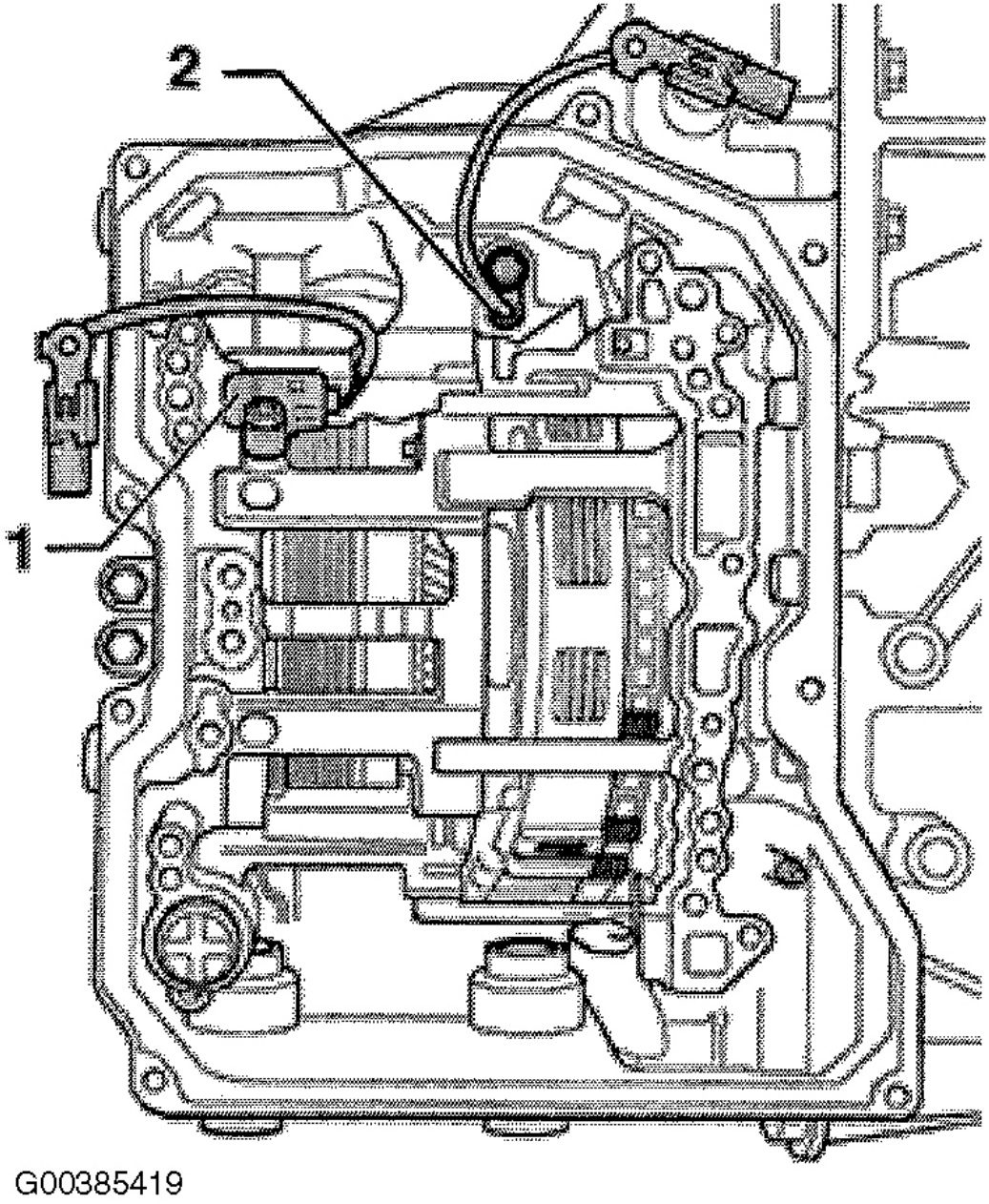


Fig. 11: Identifying Transmission Sensor & Sender For Transmission Output
Courtesy of VOLKSWAGEN UNITED STATES, INC.

SHIFT LOCK SOLENOID -N110-

Location: in selector mechanism (arrow). See **Fig. 12** .

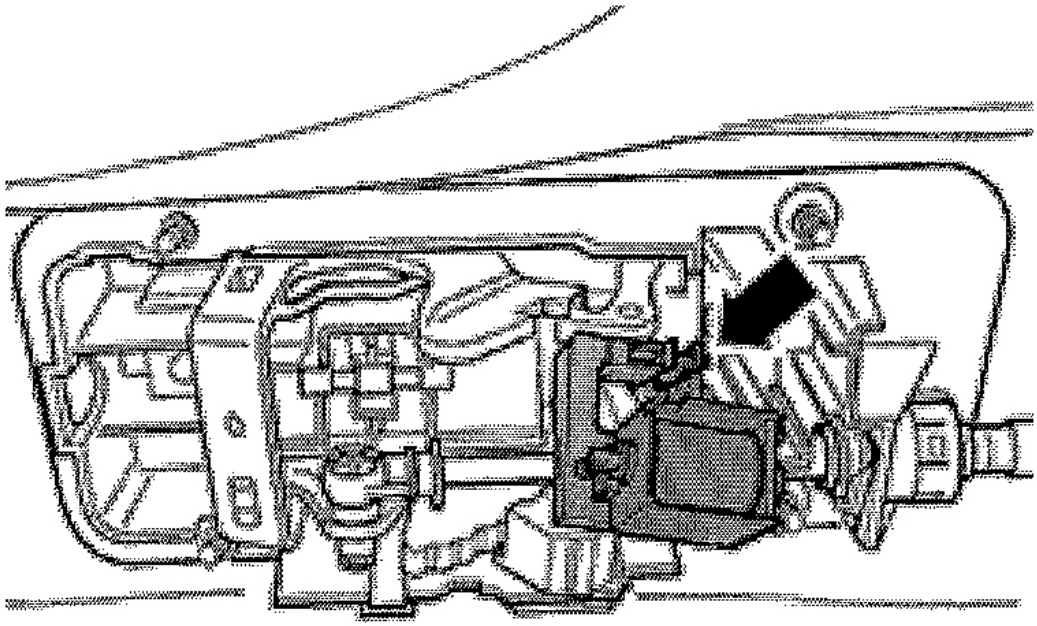


Fig. 12: Identifying Shift Lock Solenoid
Courtesy of VOLKSWAGEN UNITED STATES, INC.

TIPTRONIC SWITCH -F189-

Location: integrated into printed circuit board which is located in selector lever cover.

The Tipronic switch consists of hall sensors which are activated by a magnet (arrow) located on the cover strip sliding cover -2-. See **Fig. 13** .

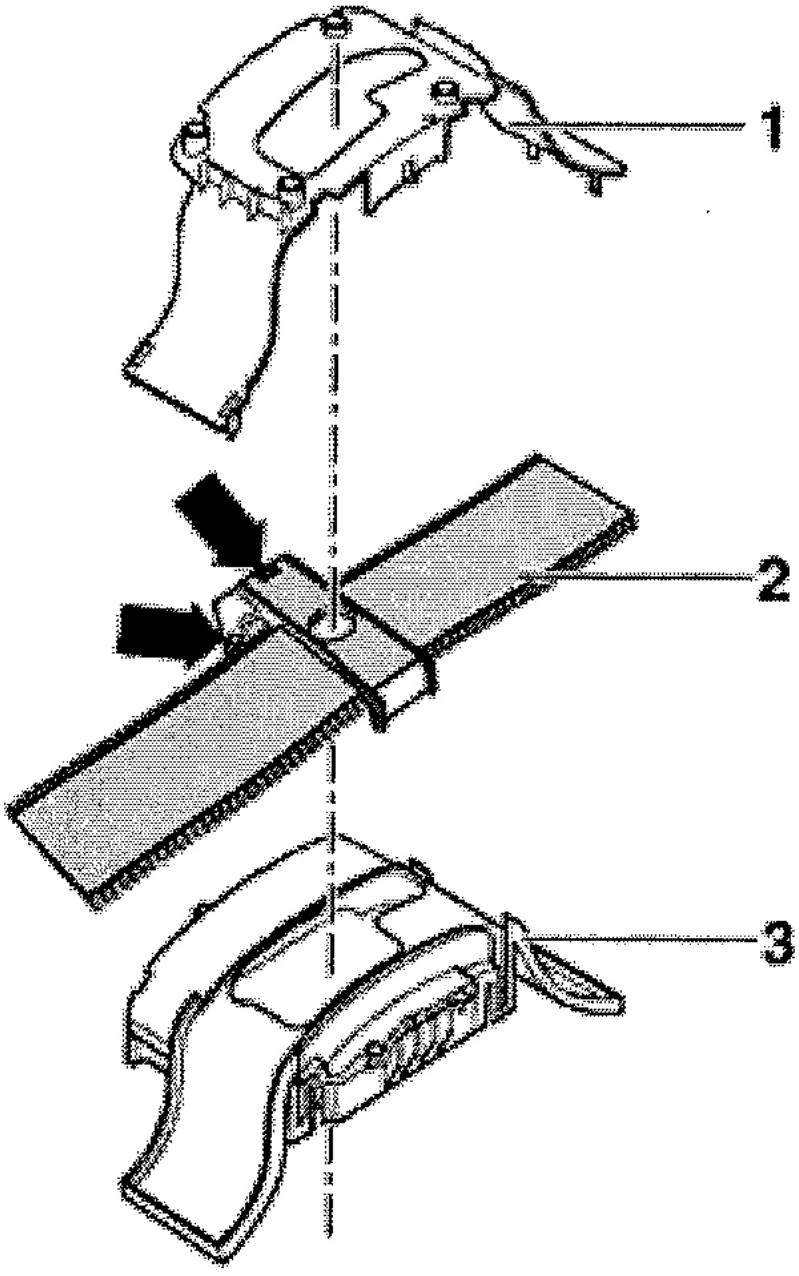


Fig. 13: Identifying Tiptronic Switch
Courtesy of VOLKSWAGEN UNITED STATES, INC.

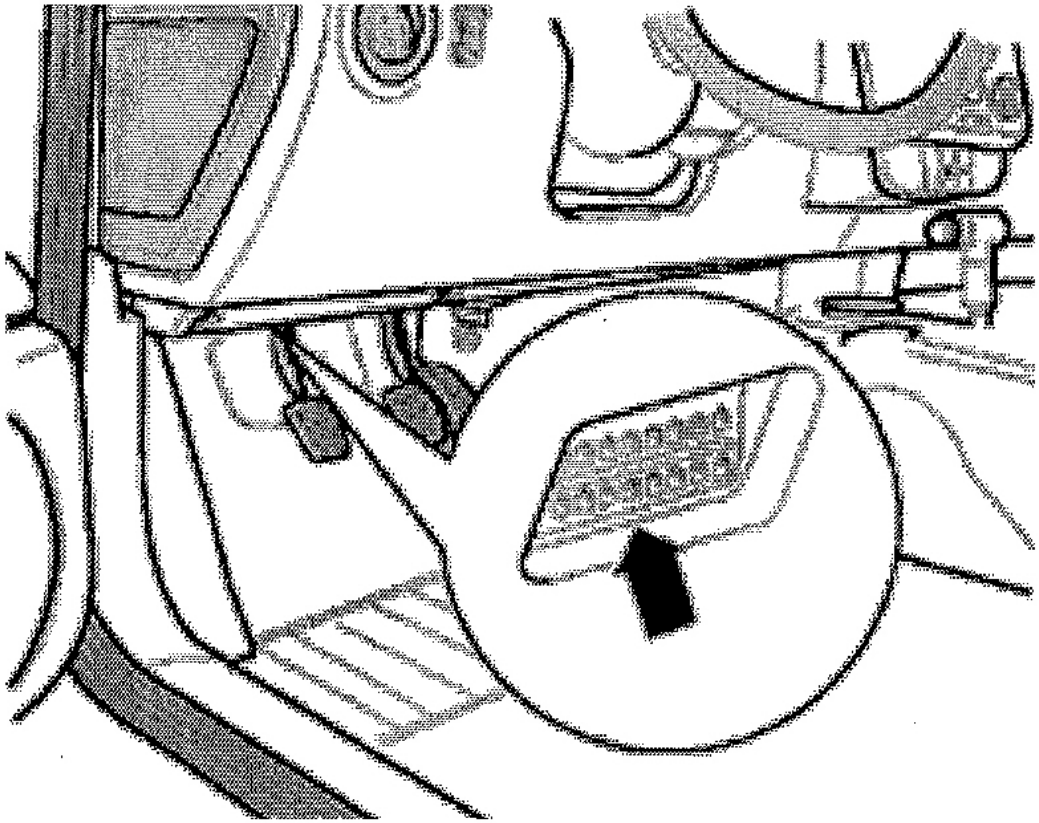
If malfunctioning, first ensure that the magnet (arrow) is securely attached to the cover strip sliding cover -2-.

See **Fig. 13** . Replace the cover strip if necessary. The selector mechanism cover with integrated printed circuit must only be replaced once the wiring has been checked.

On models with a multi-function steering wheel, the buttons on the steering wheel must also be checked along with the wiring connections.

DATA LINK CONNECTOR (DLC)

Location: (arrow) under shelf on the driver's side. See **Fig. 14** .



G00385422

Fig. 14: Locating Data Link Connector
Courtesy of VOLKSWAGEN UNITED STATES, INC.

TRANSMISSION RANGE (TR) SELECTOR LEVER DISPLAY -Y6-

Location: in instrument cluster. See **Fig. 2** .

Removing & Installing

For selector lever display removal and installation, see appropriate GAUGES & INSTRUMENT PANEL article in ACCESSORIES & EQUIPMENT.

AUTOMATIC TRANSMISSION CONTROL MODULE (TCM) -J217-

Location: (arrow) under inner plenum chamber cover. See **Fig. 15** .

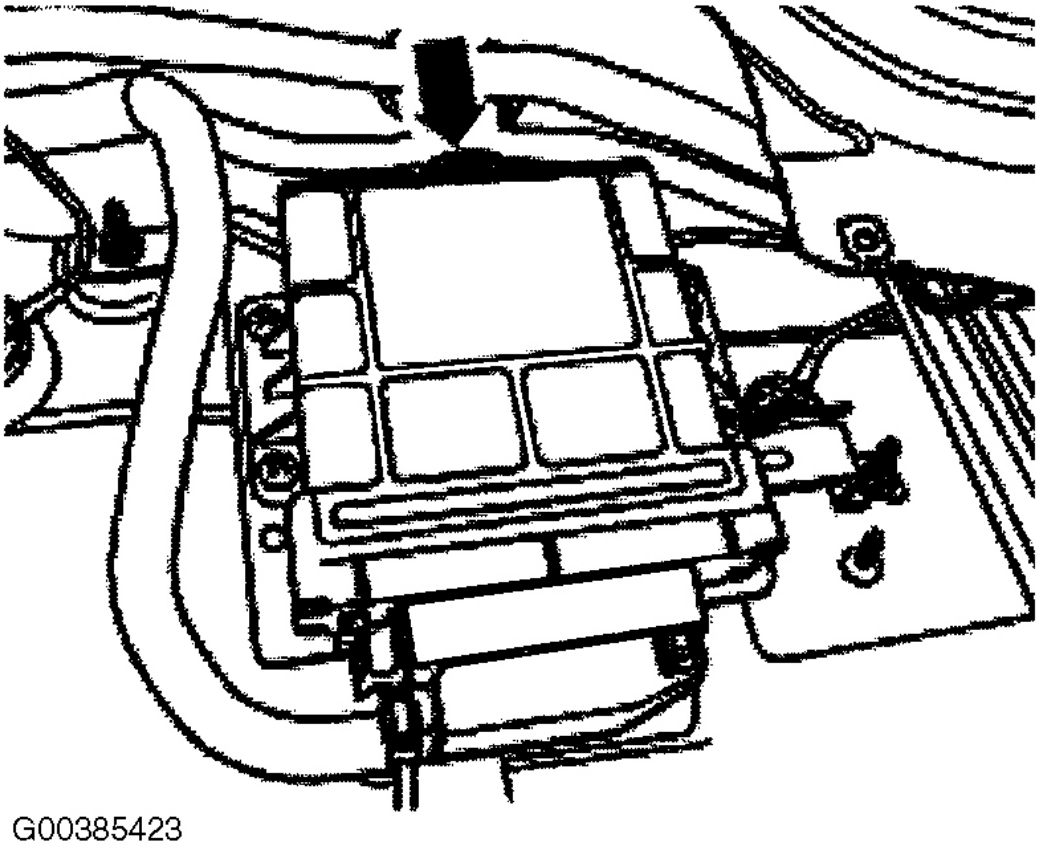


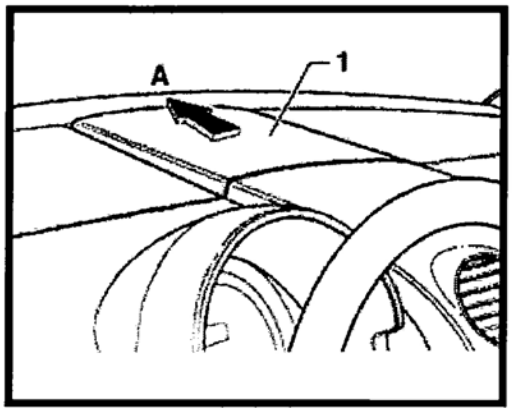
Fig. 15: Identifying Automatic Transmission Control Module
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Removal & Installation

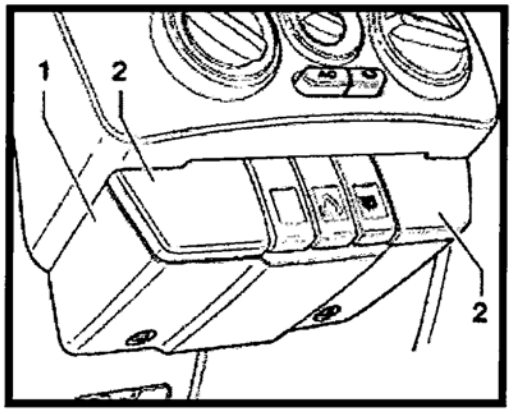
Switch ignition off.

Remove radio. See **RADIO** .

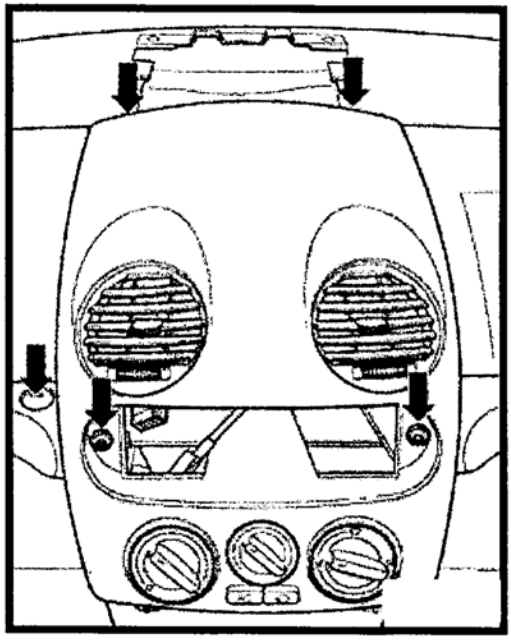
Remove center air outlet console. See **Fig. 16** .



- Push center cover -1- forward - arrow A- and lift up to remove.



- Unclip covers -2-.
- Remove lower switch console cover -1- (remove screws).



- Remove screws -arrows-.
- Remove center air outlet console.

G00387813

Fig. 16: Removing Center Air Outlet Console

Courtesy of VOLKSWAGEN UNITED STATES, INC.

Slide plenum chamber center cover -1- forward out of its locking device and take off of dash panel -arrow-. See **Fig. 17** .

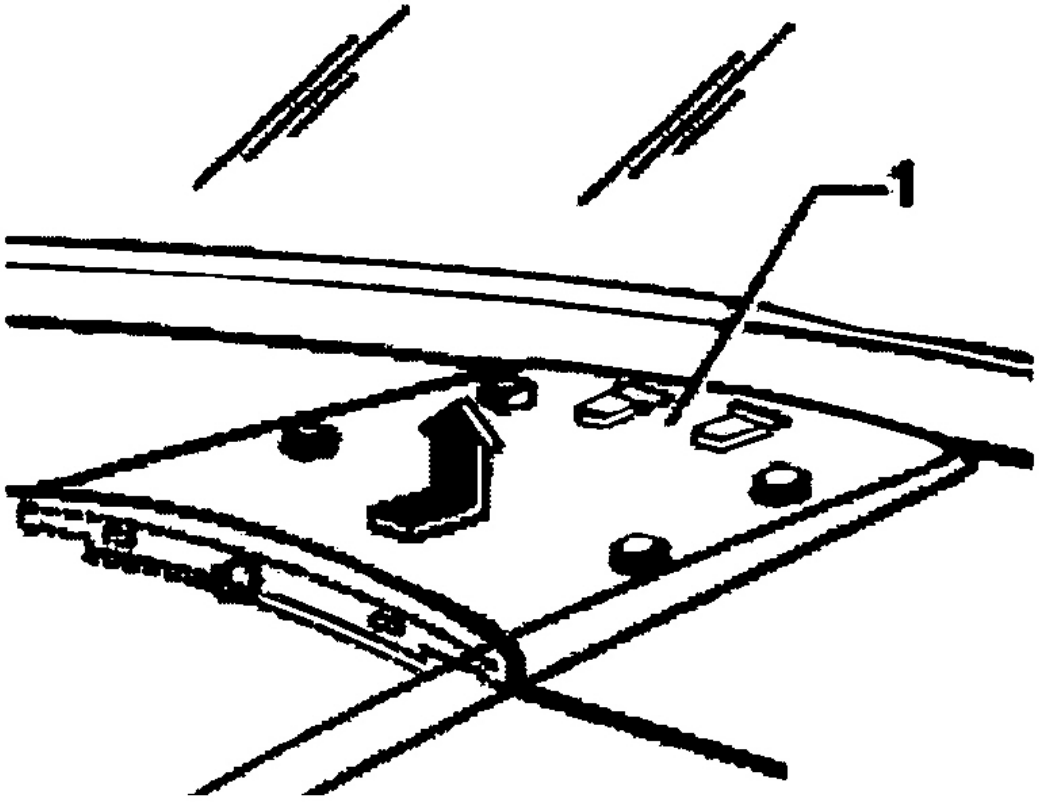


Fig. 17: Removing Dash Panel
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Remove scres -1- (Qty.). See **Fig. 18** .

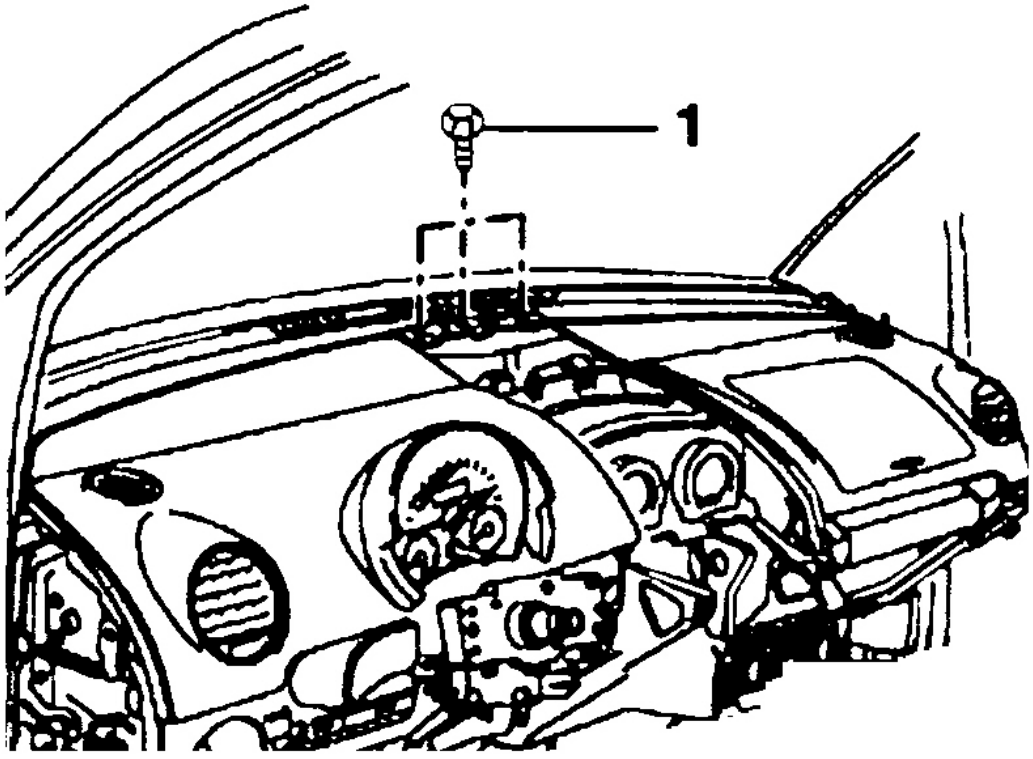
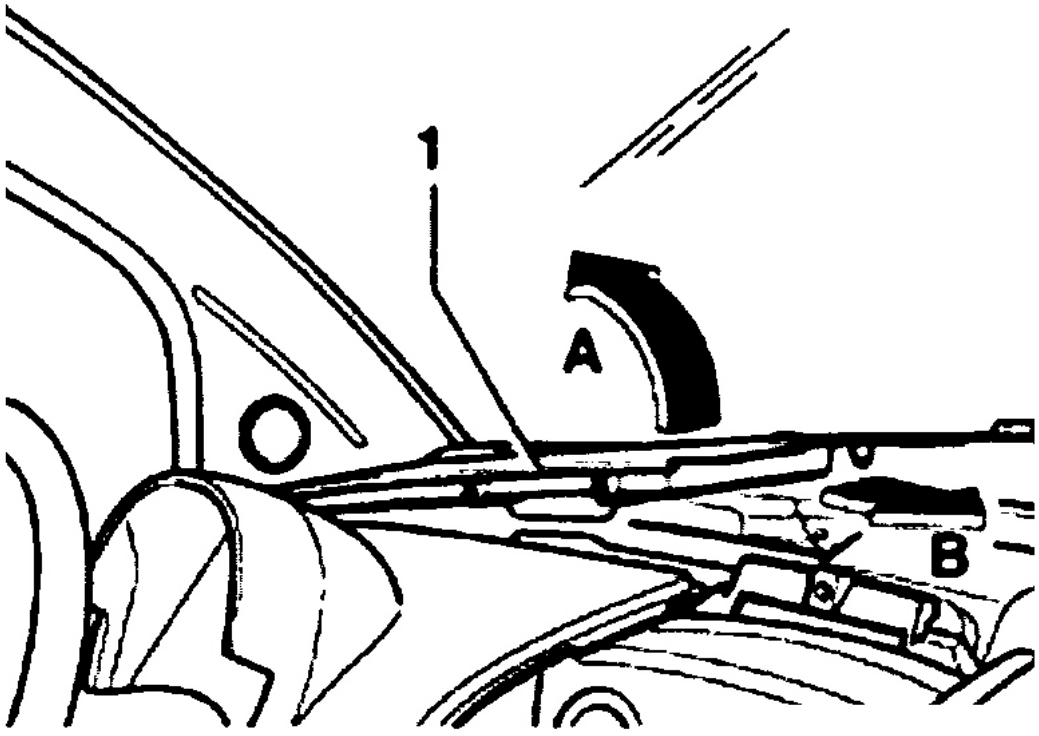


Fig. 18: Locating Plenum Cover Center Mounting Bolts
Courtesy of VOLKSWAGEN UNITED STATES, INC.

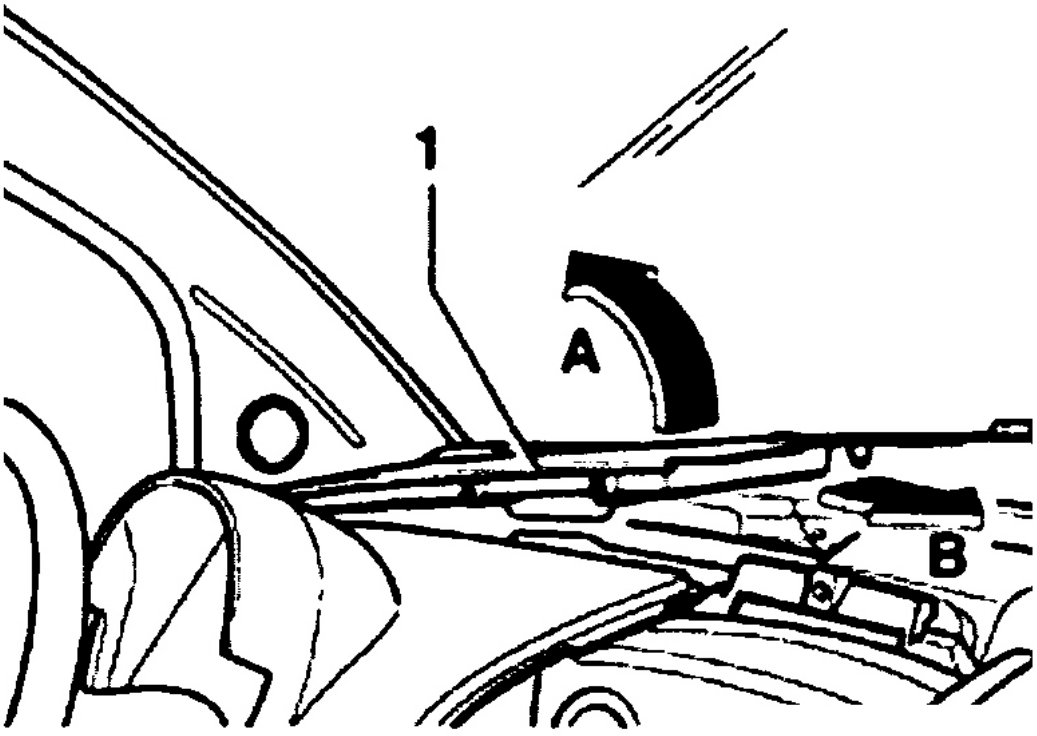
Lift left-hand plenum chamber cover -1- in the center of the instrument panel -arrow A-, this action unclips the panel (front and rear edges are clipped). See **Fig. 19** .



G00385583

Fig. 19: Removing Left Plenum Chamber Cover
Courtesy of VOLKSWAGEN UNITED STATES, INC.

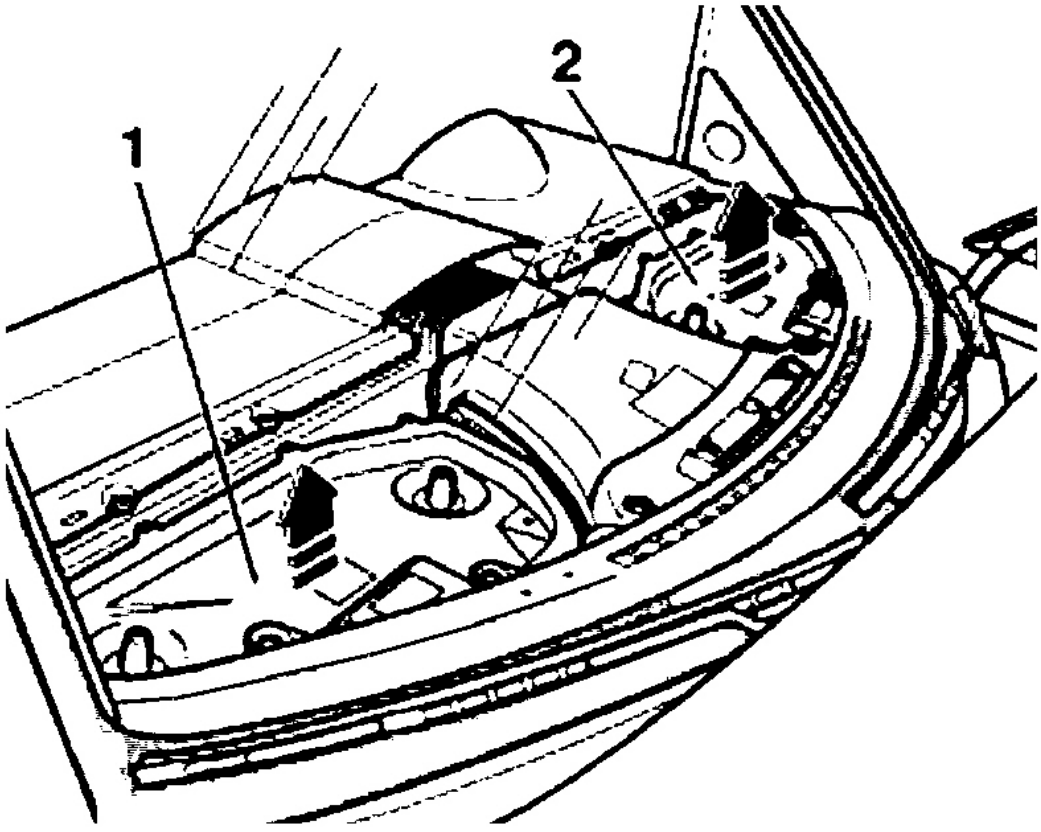
Pull cover -1- toward center of instrument panel and out of retainers in A-pillar -arrow B-. Lift right-hand plenum chamber cover -1- in the center of the instrument panel -arrow A-, this action unclips the panel (front and rear edges are clipped). See **Fig. 20** .



G00385583

Fig. 20: Removing Left Plenum Chamber Cover
Courtesy of VOLKSWAGEN UNITED STATES, INC.

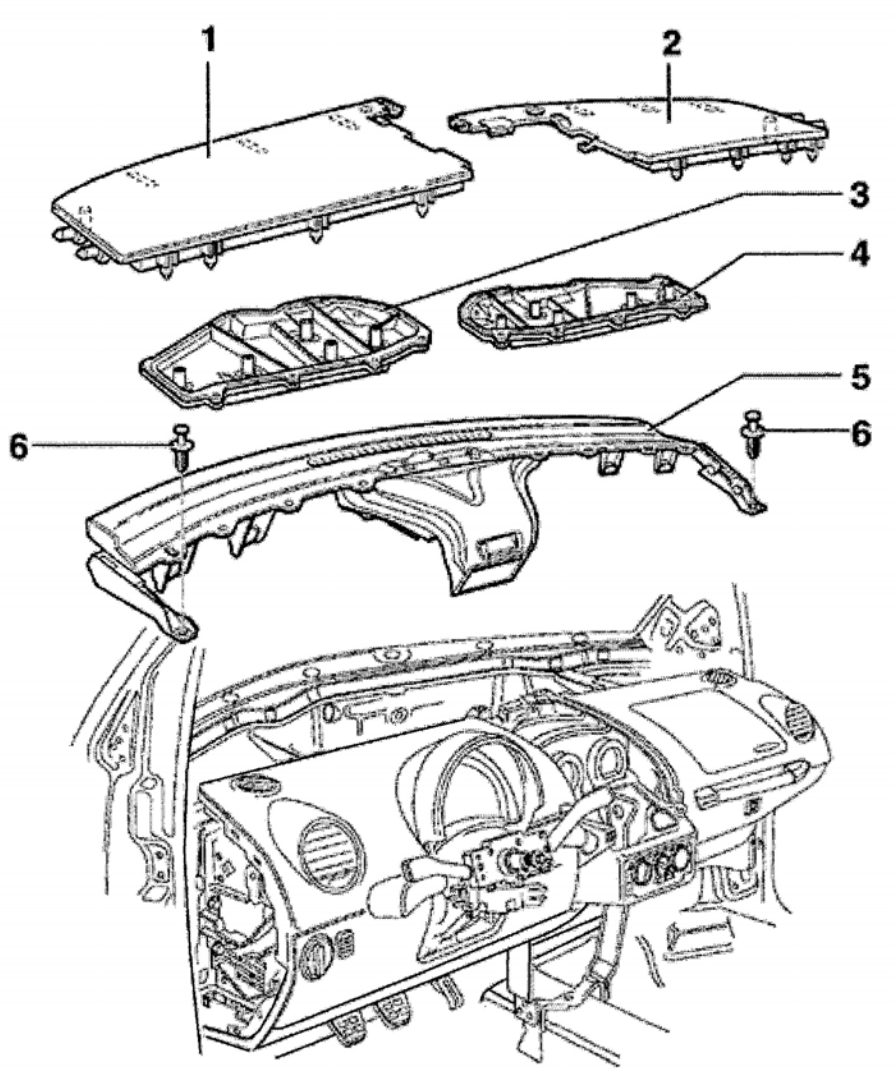
Pull cover -1- toward center of instrument panel and out of retainers in A-pillar -arrow B-. Remove securing screws from the right-hand sealing part -1- or the left-hand sealing part -2- and take sealing part off plenum chamber upward. See **Fig. 21** .



G00385586

Fig. 21: Removing Plenum Chamber Seal
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Remove closeout panels -3- and -4-. See **Fig. 22** . Remove spreader rivets -6- and lift out panel -5- from bulkhead clips.



1 - Plenum panel cover
- Driver side

2 - Plenum panel cover
- Passenger side

3 - Closeout panel
- Driver side

4 - Closeout panel
- Passenger side

5 - Defroster air outlet panel

6 - Spreader rivets

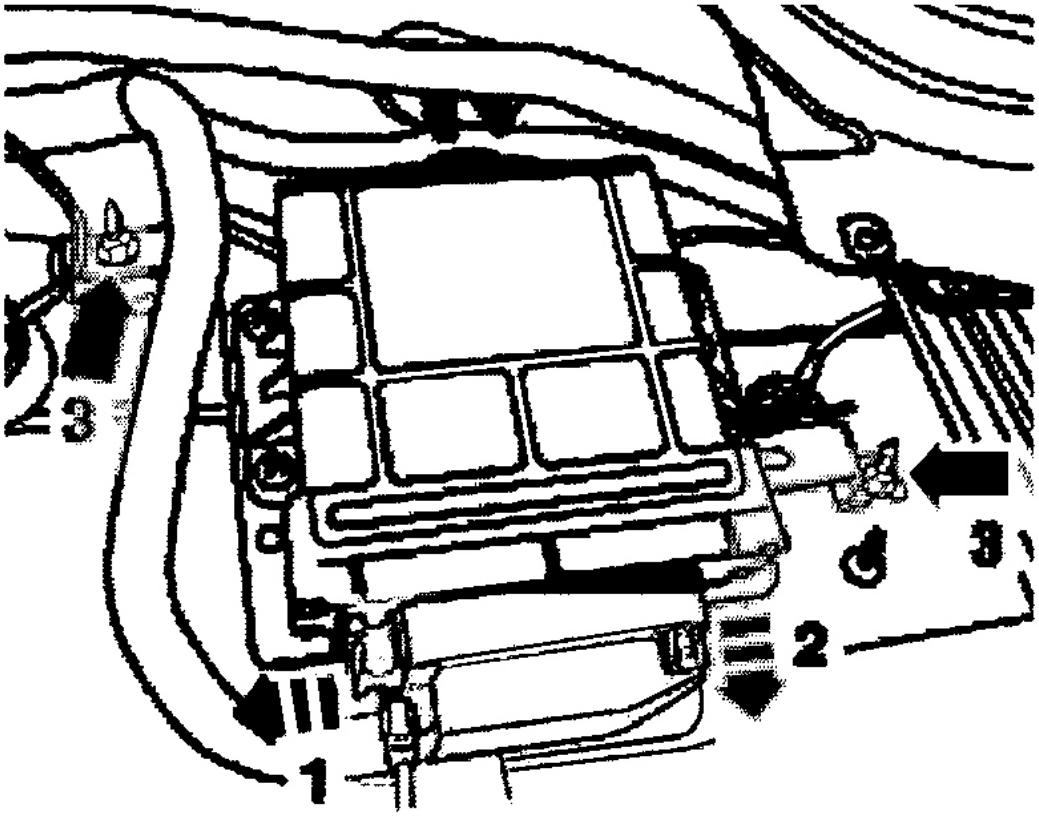
G00387814

Fig. 22: Removing Defroster Air Outlet Panel
Courtesy of VOLKSWAGEN UNITED STATES, INC.

NOTE: **Separating the connector automatically resets the adaptation values of the**

transmission. The control module must relearn the values once the transmission is operational again. The quality of the gear changes may deteriorate during the learning phase.

NOTE: The control module connector may only be connected or disconnected once a run-down period of 30 seconds has elapsed after switching the ignition off.



G00385425

Fig. 23: Locating Transmission Control Module Connectors
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Release connector (arrow -1-) and remove connector from transmission control module (arrow -2-). See **Fig. 23** .

Remove nuts (arrow -3-). See **Fig. 23** . Remove control module.

Install in reverse order.

When reinstalling multi-pin connector, fit connector onto pin of TCM -J217- (arrow -1-) and then lock multi-pin connector in position (arrow -2-). See **Fig. 24** .

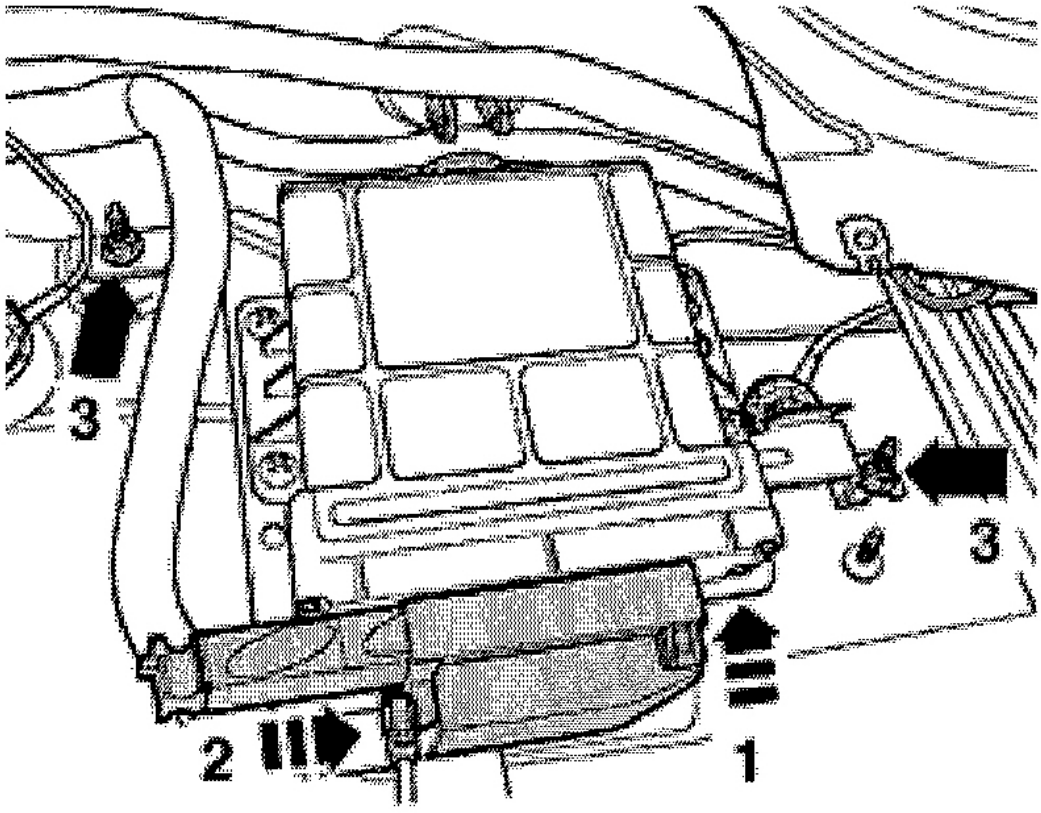


Fig. 24: Installing Transmission Control Module
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Tighten nuts (arrow -3-) to 10 Nm.

Connect VAS 5051 and advance through programs until "Functions/selecting component" is displayed. See **VAS 5051 DIAGNOSIS, TESTING AND INFORMATION SYSTEM, CONNECTING AND SELECTING FUNCTION** under ON BOARD DIAGNOSTIC (OBD), PERFORMING.

- Press "Drive (Repair group. 01;10...26; 28...39)".
- Press "6-speed automatic transmission 09G".
- Press "01 self-diagnosis".
- Press "Functions".
- Press "Initiate basic (default) setting".

RADIO

Radio Precautions

Before beginning repairs on the electrical system:

- Obtain the anti-theft radio security code.
- Switch off all electrical consumers.
- Switch ignition off and remove ignition key.
- Disconnect negative (-) battery terminal.
- When disconnecting and reconnecting battery terminals, observe all applicable Notes and torque specifications, as well as instructions on performing OBD program and electrical system function checks as specified. See **BATTERY DISCONNECTING & RECONNECTING** under GENERAL NOTES ON REPAIR.

If radio is exchanged or replaced

- Anti-theft security code for new radio must be entered before use. Be sure to advise customer of new security code.
- Confirm radio coding for sound system functions using On Board Diagnostic program function 07: "Code Control Module"
- Radio sound system coding must be performed to account for presence of CD changer (if installed), Monsoon system (where applicable) and interior sound field differences between models.

Radio "Premium V" & "Premium V - Monsoon", Removing And Installing

NOTE: Before removing the radio obtain anti-theft security code from customer. If the radio has been replaced, always activate the anti-theft coding. Be sure to advise customer of new security code.

Special Tools, Testers And Auxiliary Items Needed

Radio release tool T10057. See **Fig. 25** .

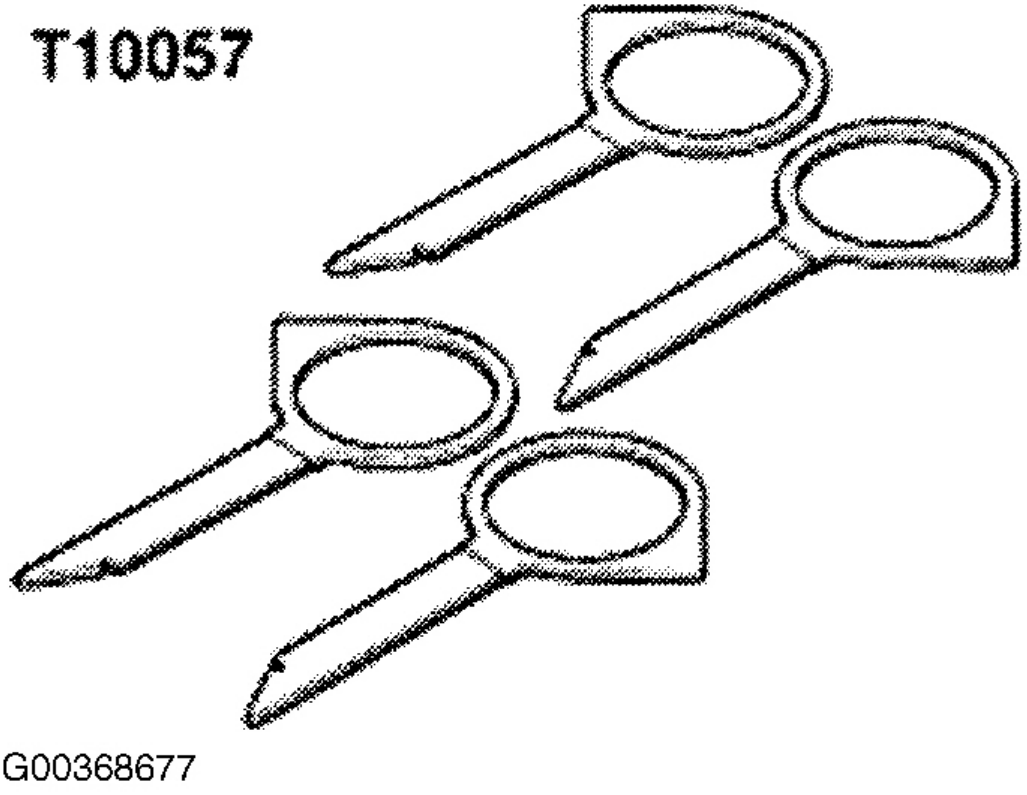


Fig. 25: Identifying Radio Removal Tools
Courtesy of AUDI OF AMERICA, INC.

Removing

Slide radio release tool T10057 into release slots -arrows- until they engage. See **Fig. 26** .

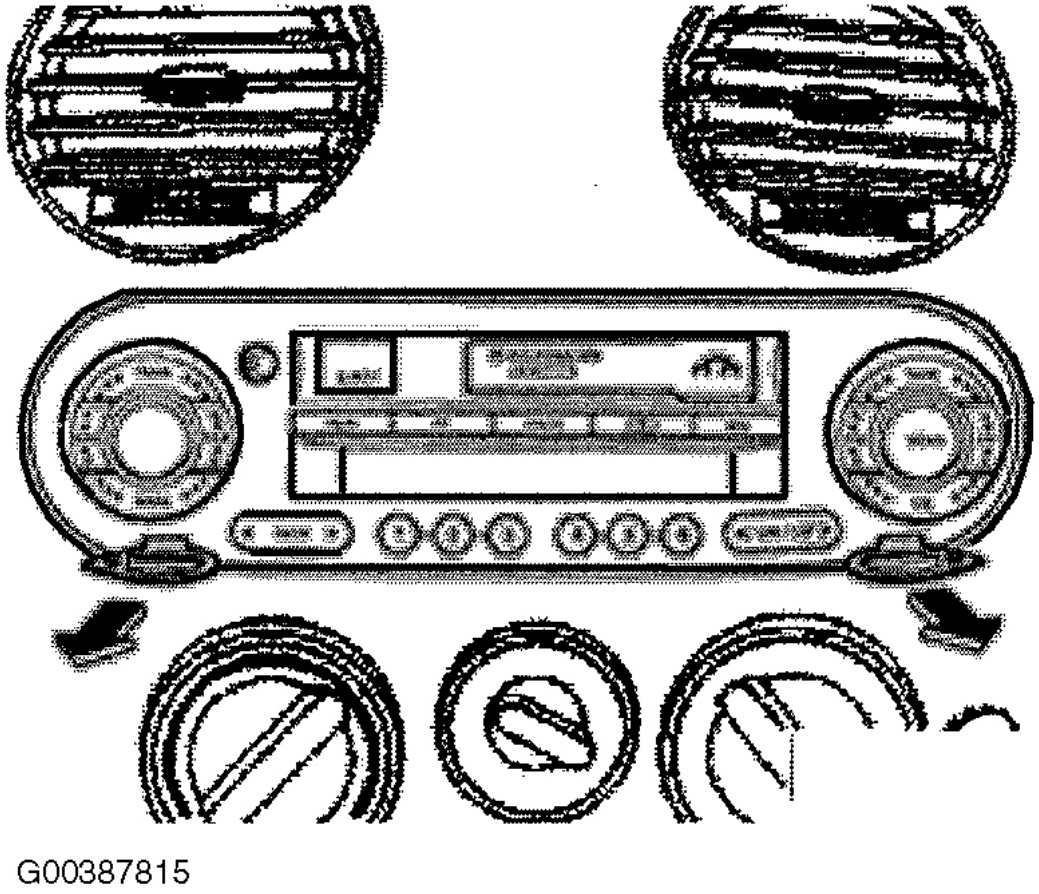


Fig. 26: Removing Radio
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Pull radio out of instrument panel using grip rings of release tools.

- The radio release tool T10057 must not be pushed to the side or tilted.
- To remove the release tools from the radio the locating lugs on the side of the radio must be pressed inward.

Disconnect electrical connections and antenna cable from rear of radio.

Installing

Reconnect electrical connectors and antenna cable to radio.

Slide radio level into instrument panel until it engages properly in assembly frame.

Input anti-theft security code. See **Anti-Theft Security Code, Inputting** .

Confirm radio coding for sound system functions using On Board Diagnostic program function 07, "Code Control Module".

NOTE: Radio sound system coding must be performed to account for presence of CD changer (if installed), Monsoon system (where applicable) and interior sound field differences between models.

Anti-Theft Security Code, Inputting

General Information

All radios are equipped with an electronic anti-theft system.

The electronic anti-theft system is activated and locks the radio as soon as:

- Voltage supply (terminal 30) drops below a predetermined voltage value.
- The radio unit is disconnected from voltage supply (terminal 30) (e.g. when removing radio unit).
- Vehicle battery (terminal 30) has been disconnected.

A radio which is locked by the electronic anti-theft system, is indicated by the letters "SAFE," which appears on the display when the radio is switched on.

Anti-Theft Security Code, Inputting

The radio will only work, if the correct code number for the anti-theft system is entered.

- The anti-theft protection code can be found along with the radio number on the radio card in Owner's Manual.
- For safety reasons, never leave the radio card in the car. If necessary, ask the customer for the code.

Perform steps in the exact order given below:

Obtain anti-theft code number from radio card.

Switch radio on.

"SAFE" will appear on the display.

After 3 seconds, the number 1000 will appear on the display.

Use station preset buttons (B) -1- to -4- to enter the 4digit code number. See **Fig. 27** .

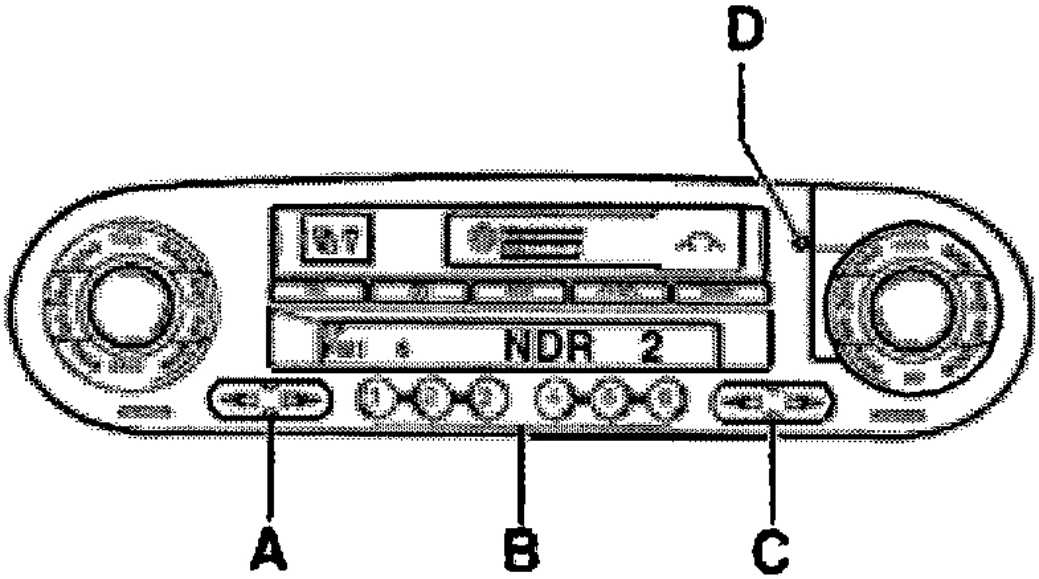


Fig. 27: Identifying Radio Button Locations
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Press preset button -1- to enter first digit in the code number, preset button -2- for second digit and so on. See **Fig. 27** .

Press preset button -1- to enter first digit in the code number, preset button -2- for second digit and so on. See **Fig. 27** .

The value range for each of the 4 digits is between 0 and 9. If a button is pressed beyond desired number, the sequence will start over at 1 after 9 is pressed. See **Fig. 27** .

When entire code is entered, press right side of "Seek/Track" rocker button -C- for about 2 seconds, until an audible signal is heard. See **Fig. 27** .

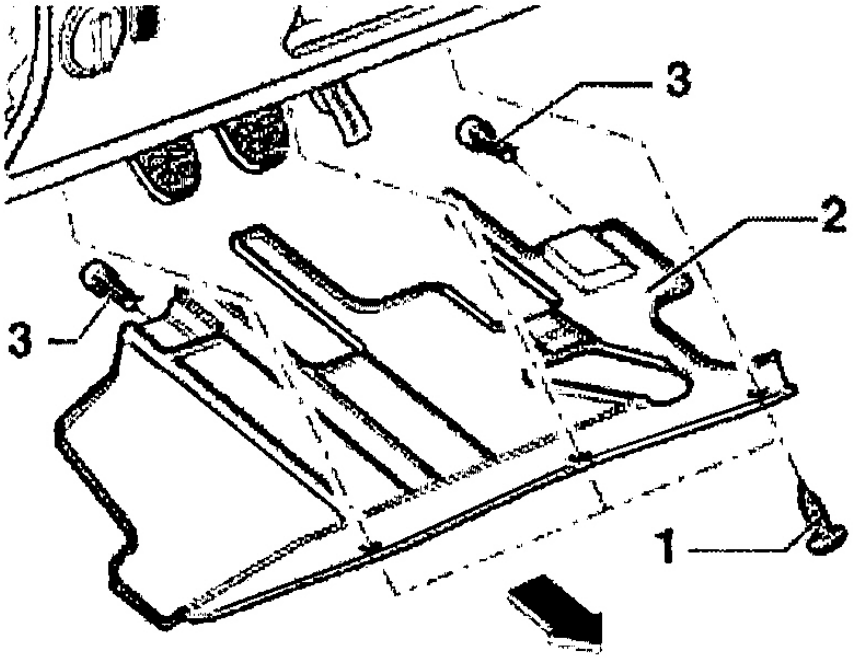
NOTE: If a wrong code was accidentally entered, the display will flash "SAFE" initially, and then remain on. The coding procedure may be repeated a second time (the number of coding attempts is displayed). If a wrong code is entered again, the radio will be disabled for an hour. If this happens, leave the radio ON and the key in the ignition for one hour. After the hour has elapsed, the number of attempts stops being displayed and the electronic lock can be cancelled. The cycle is: 2 attempts, 1 hour locked.

CHECK STARTING INTERLOCK RELAY -J207-

Special Tools And Equipment

- Electrical Wiring Diagrams, Troubleshooting & Component Locations

Remove cover in driver's footwell. See **Fig. 28** .



Removing

- Remove screws -1-.
- Pull driver's side footwell cover -2- out of retainers -3-.

Installing

Install in reverse order of removal.

G00385427

Fig. 28: Removing & Installing Driver's Footwell Cover
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Turn ignition key to position "Start".

Move selector lever from position "S" to "P" and back to "S" again.

Starting interlock relay -J207- must audibly and perceptibly operate.

Starter must operate in positions "N" or "P" as long as no fault exists.

If the relay does not operate:

- Check Starting interlock relay -J207- and wiring connections plate according to wiring diagram.

ON BOARD DIAGNOSTIC (OBD), PERFORMING

SUPPLEMENTARY INFORMATION

- **SERVICING - A/T (09G)** article
- Appropriate SYSTEM WIRING DIAGRAM article in ELECTRICAL
- Available Parts catalog

REQUIREMENTS

- Selector lever in position "P" and parking brake applied
- Vehicle voltage supply OK
- Fuses OK

NOTE: The ground connecting point is located in the engine compartment (below the battery).

- All Ground connections for transmission OK:
  a. Check ground connections for corrosion and poor contact; repair if necessary.
  b. Check battery ground strap and ground strap between battery and transmission.

SAFETY PRECAUTIONS

Observe the following if test and measuring instruments are required during a road test:

- Test and measuring instruments must be secured to the rear seat and operated by an assistant from this location.
- If test and measuring instruments are operated from the front passenger's seat and the vehicle is involved in an accident, there is a possibility that the person sitting in this seat may receive serious injuries when the airbag is triggered.

VAS 5051 DIAGNOSIS, TESTING AND INFORMATION SYSTEM, CONNECTING AND

SELECTING FUNCTION

Special Tools And Equipment

- VAS 5051 Vehicle Diagnosis, Testing and Information System. See **Fig. 29** .

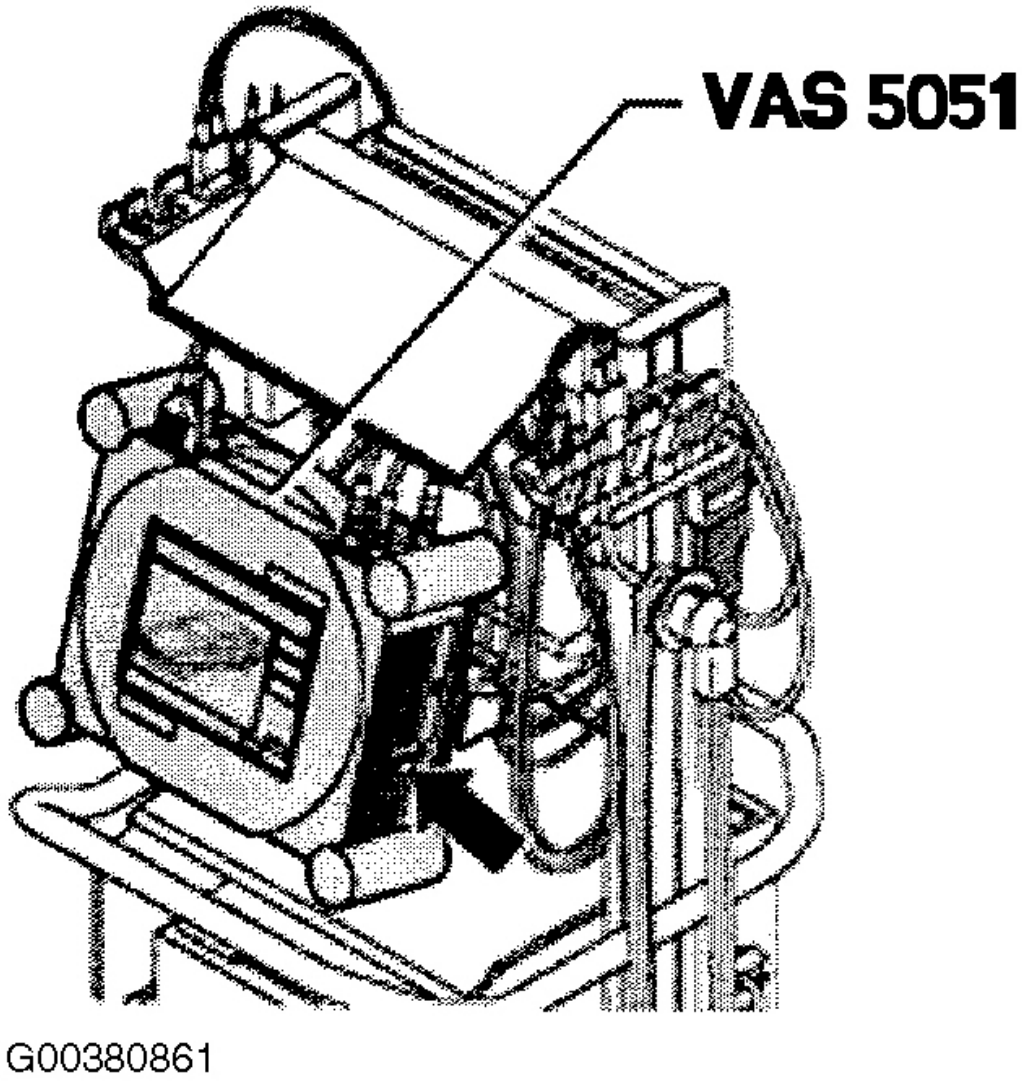


Fig. 29: Identifying Tester (VAS 5051)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

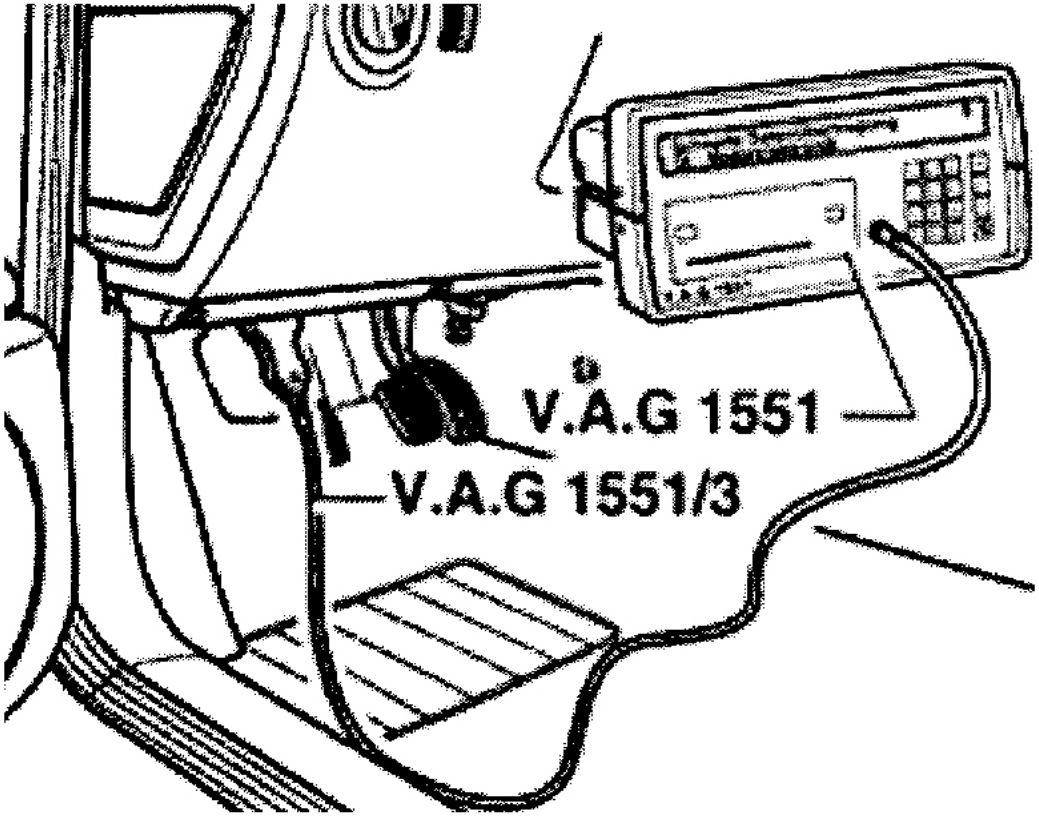
- Diagnostic cable VAS 5051/1 or VAS 5051/3

Connecting & Selecting Function

VAS 5051

WARNING: When performing a road test the test and measuring units must be secured on the rear seat. During the road test only one person must operate these units.

Connect tester VAS 5051 to Data Link Connector (DLC) using diagnostic cable VAS 5051/1 or VAS 5051/3 with ignition switched off. See **Fig. 30** .



G00380862

Fig. 30: Connecting Diagnostic Cable (VAG 1551/3A)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Switch tester on (arrow). See **Fig. 29** . The tester is operationally ready when a picture (photograph) of a vehicle appears on the display.

Switch ignition on.

Touch key on screen for: Guided Fault Finding.

Select one after another:

- Brand
- Model
- Model year
- Variant
- Engine code

NOTE: Wait until the tester has read all the available control modules.

Confirm data as entered:

Using "Go to" key, select "Function/component selection"

Follow instructions on screen to start functions desired.

V.A.G. 1551

NOTE: The following description is for displays and V.A.G 1551 printouts.

Switch ignition on.

Operate brake pedal once.

Switch on printer with Print key (indicator lamp in key lights up).

Press key 1 for "Rapid data transfer" mode.

Indicated on display:

- Rapid data transfer HELP
- Enter address word XX

Press keys 0 and 2. ("02" enters address word "transmission electronics").

Indicated on display:

- Rapid data transfer Q
- 02 transmission electronics

Confirm entry with Q key.

Indicated on display:

- 09G927750N AQ 250 6F 0250 "right arrow"
- Codierung 00008 WSC 00000

The control module identification, coding and the Dealership number are shown on the V.A.G 1551 display.

Control Module Identification

NOTE: Depending upon build level (program level) the control module can indicate a different control module identification from that shown in the example. Allocation of control module. See available parts catalog.

- 09G927750N: Part number
- AQ 250 6F: 6-speed automatic transmission 09G
- 0250: EPROM (program level)
- Coding 00008: Coding
- WSC 00000: Dealership code of V.A.G 1551 with which the last coding was performed

Indicated on display:

- Control module does not answer! HELP

By pressing "HELP" key a list of possible fault causes is printed out.

After eliminating possible causes of faults, again enter address word 02 for "transmission electronics" and confirm.

If "Control module does not answer!" again appears:

- Indicated on display: Control module does not answer! HELP
- Check control module voltage supply.
- Perform test step 1. See **ELECTRICAL CHECK** .
- Check wiring connections to diagnostic sockets. See appropriate SYSTEM WIRING DIAGRAM article in ELECTICAL.
- Refer to DTC table. See **DIAGNOSTIC TROUBLE CODE (DTC) TABLE** under DTC 65535: control module faulty!

Press "right arrow" key.

Indicated on display:

- Rapid data transfer HELP
- Select function XX

After the HELP key is pressed, a list of the possible functions is printed out.

List Of Selectable Functions

SELECTABLE SCAN TOOL FUNCTIONS

Function No.	Description
01	**Check Control Module Version - On Board Diagnostic (OBD), Conducting**
02	**Check Diagnostic Trouble Code (DTC) Memory**
04	**Initiate Basic Setting**
05	**Erase DTC Memory**
06	End Output
08	**Read Measured Value Block**

After checking a function the V.A.G 1551 returns to the following start position as indicated on display:

- Rapid data transfer HELP
- Select function XX

DIAGNOSTIC TROUBLE CODE (DTC) MEMORY, CHECKING

Connect VAS 5051 and select functions from **VAS 5051 DIAGNOSIS, TESTING AND INFORMATION SYSTEM, CONNECTING AND SELECTING FUNCTION** .

The Following Description Refers To The V.A.G 1551

Indicated on display:

- Rapid data transfer HELP
- Select function XX

Press keys 0 and 2. (02 selects function "Check DTC memory").

Indicated on display:

- Rapid data transfer Q
- 02 - Check DTC memory

Confirm entry with Q key.

The number of DTCs stored or "No DTC detected!" will be shown on the display.

If One Or More DTCs Are Stored

The stored DTCs will be displayed and printed out one after the other.

After the stored DTCs have been printed out, the display will show:

- Rapid data transfer HELP
- Select function XX

Eliminate printed-out DTCs using appropriate table. See **DIAGNOSTIC TROUBLE CODE (DTC) TABLE** .

Erase DTC memory. See **DIAGNOSTIC TROUBLE CODE (DTC) MEMORY, ERASING** .

If No DTC Is Stored

Press "right arrow" key.

Indicated on display:

- Rapid data transfer HELP
- Select function XX

Press keys 0 and 6 for "End data transfer" function and confirm input with Q key.

DIAGNOSTIC TROUBLE CODE (DTC) TABLE

Notes

- At the beginning of every fault finding an automatic test sequence must be initiated (key function 0 and 0) for every control module in the vehicle because the control modules are connected with one another via two data bus wires. When doing this the vehicle control modules are checked for possible faults.
- If a fault occurs only occasionally or if the DTC memory was not erased after correcting the faults, these faults will be displayed as "sporadic faults" for a stipulated period of time. See **TRANSMISSION CONTROL MODULE FAULT RECOGNITION** under ON BOARD DIAGNOSTIC (OBD), FUNCTION.
- All the possible faults which are recognized by the automatic Transmission Control Module -J217- and can be printed out on the V.A.G 1551 or the VAS 5051 are listed up as a 5-digit fault code.
- The DTC appears (in the "Rapid data transfer" mode) on the print-out only.

DTC Example

DTC EXAMPLE

Application	Number Of Digits	Example
VAG or VAS Code	5	18258
P-Code	5	P1850

Type Number Of Fault	3	035

- For some DTCs a 5-digit P-code also appears.
- The 3-digit fault type number is a datacode which can be disregarded. Any text for the fault type must be considered.
- If components are indicated as being faulty by the DTC memory, additionally test the wiring to the components for short and open circuits according to the wiring diagram.
- After repairs the DTC memory must be checked again with the V.A.G 1551 Scan Tool or the tester VAS 5051 and erased.

Diagnostic Trouble Code (DTC) Table

DIAGNOSTIC TROUBLE CODE (DTC)

OBD II DTC (1)	VAG DTC	Related Component
.....	.....	**No DTCs Recognized**
.....	**00258**	Solenoid Valve 1
.....	**00260**	Solenoid Valve 2
.....	**00262**	Solenoid Valve 3
.....	**00264**	Solenoid Valve 4
.....	**00266**	Solenoid Valve 5
.....	**00268**	Solenoid Valve 6
.....	**00293**	Multi-Function Transmission Range Switch
.....	**00300**	Transmission Fluid Temperature Sensor
.....	**00348**	Solenoid Valve 9
.....	**00349**	Solenoid Valve 10
.....	**00364**	Voltage Supply Terminal 15
.....	**00453**	Function Restriction Because Of Excess Temperature
.....	**00529**	RPM Information Missing
.....	**00541**	ATF Temperature
.....	**00777**	Throttle Position Sensor
.....	**01045**	Tiptronic Switch
.....	**01166**	Engine Torque Signal
.....	**01192**	Torque Converter Lock-Up Clutch
.....	**01236**	Shift Lock Solenoid
.....	**01312**	Data Bus Drive
.....	**01312**	Engine Control Module
.....	**01314**	Engine Control Module
.....	**01316**	ABS Control Module
.....	**01679**	Speed Signal From ABS For Front Left Wheel
.....	**01680**	Speed Signal From ABS For Front Right Wheel
.....	**01681**	Speed Signal From ABS For Rear Left Wheel

.....	**01682**	Speed Signal From ABS For Rear Right Wheel
.....	**01683**	Wheel Speed Signals/Vehicle Speed
P0604	**16988**	Control Module Faulty
P0605	**16989**	Control Module Faulty
P0613	**16997**	Control Module Faulty
P0700	**17084**	Control Module Faulty
P0705	**17089**	Driving Range Sensor
P0706	**17090**	Driving Range Sensor
P0711	**17095**	Transmission Fluid Temperature Sensor
P0712	**17096**	Transmission Fluid Temperature Sensor
P0713	**17097**	Transmission Fluid Temperature Sensor
P0715	**17099**	Sensor For Transmission RPM
P0716	**17100**	Sensor For Transmission RPM
P0717	**17101**	Sensor For Transmission RPM
P0721	**17105**	Sender For Transmission Output
P0725	**17109**	Speed Signal From Engine Control Module
P0729	**17113**	6th Gear Wrong Demultiplication Ratio
P0730	**17114**	Gear/Demultiplication Control
P0731	**17115**	1st Gear
P0732	**17116**	2nd Gear
P0733	**17117**	3rd Gear
P0734	**17118**	4th Gear
P0735	**17119**	5th Gear
P0748	**17132**	Pressure Control valve 1
P0751	**17135**	Switch Valve 1 Solenoid Valve 1
P0752	**17136**	Switch Valve 1 Solenoid Valve 1
P0753	**17137**	Switch Valve 1 Solenoid Valve 1
P0756	**17140**	Switch Valve 2 Solenoid Valve 2
P0757	**17141**	Switch Valve 2 Solenoid Valve 2
P0758	**17142**	Switch Valve 2 Solenoid Valve 2
P0798	**17182**	Pressure Control Valve 3
P0811	**17195**	Heavy Clutch Slip
P0840	**17224**	Transmission Hydraulic Pressure Sensor 1
P0841	**17225**	Transmission Hydraulic Pressure Sensor 1
P0842	**17226**	Transmission Hydraulic Pressure Sensor 1
P0845	**17299**	Transmission Hydraulic Pressure Sensor 2
P0846	**17230**	Transmission Hydraulic Pressure Sensor 2
P0847	**17231**	Transmission Hydraulic Pressure Sensor 2
P1560	**17968**	Maximum Engine RPM Surpassed
P00864	(2)	Engine Control Module

P1602	**18010**	Voltage Supply Terminal 30
P1847	**18255**	Read DTC Memory Of ABS Control Module
P2122	**18554**	Throttle Position Sensor
P2714	**19146**	Pressure Control Valve 4
P2715	**19147**	Pressure Control Valve 4
P2716	**19148**	Pressure Control Valve 4
P2723	**19155**	Pressure Control Valve 5
P2724	**19156**	Pressure control Valve 5
P2725	**19157**	Pressure Control Valve 5
P2723	**19164**	Pressure Control Valve 6
P2733	**19165**	Pressure Control Valve 6
P2734	**19166**	Pressure Control Valve 6
.....	**65535**	Control Module Faulty

(1) Not all VAG DTCs have OBD II DTCs available.

(2) VAG DTC not available.

No DTCs Recognized

V.A.G 1551 print-out	
No DTCs recognized!	If "No DTCs recognized" appears after performing repairs, the OBD is completed. In the event that the automatic transmission does not operate properly despite performing the OBD, read measured value block. See MEASURED VALUE BLOCK READING.

G00385428

Fig. 31: No DTCs Recognized
Courtesy of VOLKSWAGEN UNITED STATES, INC.

DTCs 00258 & 00260

V.A.G 1551 print-out (See DIAGNOSTIC TROUBLE CODE (DTC) TABLE)	Possible cause	Correction
00258 Solenoid valve 1 -N88- Open circuit/short to Ground[1)] Short to positive [1)]	Open circuit or short to Ground/positive Solenoid valve 1 -N88- faulty	- Check wiring and connections according to wiring diagram - Read measured value block. See MEASURED VALUE BLOCK READING; Display group number 008 - Perform electrical check. See ELECTRICAL CHECK
00260 Solenoid valve 2 -N89- Open circuit/short to Ground[1)] Short to positive [1)]	Open circuit or short to Ground/positive Solenoid valve 2 -N89- faulty	- Check wiring and connections according to wiring diagram - Read measured value. See MEASURED VALUE BLOCK READING; Display group number 008 - Perform electrical check. See ELECTRICAL CHECK

[1)] One of these displays appears in addition to relevant component.

G00385429

Fig. 32: DTCs 00258 & 00260 Diagnostics
Courtesy of VOLKSWAGEN UNITED STATES, INC.

DTCs 00262 & 00264

V.A.G 1551 print-out (See DIAGNOSTIC TROUBLE CODE (DTC) TABLE)	Possible cause	Correction
00262 Solenoid valve 3 -N90- Open circuit/short to Ground[1)] Short to positive [1)]	Open circuit or short to Ground/positive Solenoid valve 3 - N90- faulty	- Check wiring and connections according to wiring diagram - Read measured value block. See See MEASURED VALUE BLOCK READING; Display group number 007 - Perform electrical check. See ELECTRICAL CHECK
00264 Solenoid valve 4 -N91- Open circuit/short to Ground[1)] Short to positive [1)]	Open circuit or short to Ground/positive Solenoid valve 4 - N91- faulty	- Check wiring and connections according to wiring diagram - Read measured value block. See See MEASURED VALUE BLOCK READING; Display group number 008 - Perform electrical check. See ELECTRICAL CHECK

[1)] One of these displays appears in addition to relevant component.

G00385430

Fig. 33: DTCs 00262 & 00264 Diagnostics
Courtesy of VOLKSWAGEN UNITED STATES, INC.

DTCs 00266 & 00268

V.A.G 1551 print-out (See DIAGNOSTIC TROUBLE CODE (DTC) TABLE)	Possible cause	Correction
00266 Solenoid valve 5 -N92- Open circuit/short to Ground[1)] Short to positive [1)]	Open circuit or short to Ground/positive Solenoid valve 5 - N92- faulty	- Check wiring and connections according to wiring diagram - Read measured value block. See See MEASURED VALUE BLOCK READING; Display group number 007 - Perform electrical check. See ELECTRICAL CHECK
00268 Solenoid valve 6 -N93- Open circuit/short to Ground[1)] Short to positive [1)]	Open circuit or short to Ground/positive Solenoid valve 6 - - N93- faulty	- Check wiring and connections according to wiring diagram - Read measured value block. See See MEASURED VALUE BLOCK READING; Display group number 008 - Perform electrical check. See ELECTRICAL CHECK

[1)] One of these displays appears in addition to relevant component.

G00385431

Fig. 34: DTCs 00266 & 00268 Diagnostics
Courtesy of VOLKSWAGEN UNITED STATES, INC.

DTC 00293

V.A.G 1551 print-out (See DIAGNOSTIC TROUBLE CODE (DTC) TABLE)	Possible cause	Correction
00293	Open circuit or short to Ground/positive	- Check wiring and connections according to wiring diagram [1]
Multi-function switch -F125-	Multi-function Transmission Range (TR) switch -F125- faulty	- Read measured value block. See See MEASURED VALUE BLOCK READING; Display group number 009
Implausible signal		- Perform electrical check. See ELECTRICAL CHECK - Replace Multi-function TR switch - F125-. See SERVICING – A/T (09G) article

[1] First check 10-pin connector for corrosion or water entry and replace if necessary.

G00385432

Fig. 35: DTC 00293 Diagnostic
Courtesy of VOLKSWAGEN UNITED STATES, INC.

DTC 00300

V.A.G 1551 print-out (See DIAGNOSTIC TROUBLE CODE (DTC) TABLE)	Possible cause	Correction
00300	Open circuit or short to Ground/positive	- Check wiring and connections according to wiring diagram
Transmission fluid temperature sensor -G93-	Transmission fluid temperature sensor -G93- faulty	- Read measured value block. See See MEASURED VALUE BLOCK READING; Display group number 006
Short to Ground [1)]		- Perform electrical check. See ELECTRICAL CHECK
Open circuit/short to positive[1)]		
	ATF level not OK	- Checking ATF level: See SERVICING – A/T (09G) article

[1)] One of these displays appears in addition to relevant component.

G00385433

Fig. 36: DTC 00300 Diagnostic
Courtesy of VOLKSWAGEN UNITED STATES, INC.

DTCs 00348 & 00349

V.A.G 1551 print-out (See DIAGNOSTIC TROUBLE CODE (DTC) TABLE)	Possible cause	Correction
00348	Open circuit or short to Ground/positive	- Check wiring and connections according to wiring diagram
Solenoid valve 9 -N282-	Solenoid valve 9 - N282- faulty	- Read measured value block. See See MEASURED VALUE BLOCK READING; Display group number 007
Open circuit/short to Ground[1)]		- Perform electrical check. See ELECTRICAL CHECK
Short to positive [1)]		
00349	Open circuit or short to Ground/positive	- Check wiring and connections according to wiring diagram
Solenoid valve 10 -N283-	Solenoid valve 10 - N283- faulty	- Read measured value block. See See MEASURED VALUE BLOCK, READING; Display group number 007
Open circuit/short to Ground[1)]		- Perform electrical check. See ELECTRICAL CHECK
Short to positive [1)]		

[1)] One of these displays appears in addition to relevant component.

G00385434

Fig. 37: DTCs 00348 & 00349 Diagnostics
Courtesy of VOLKSWAGEN UNITED STATES, INC.

DTC 00364

V.A.G 1551 print-out (See DIAGNOSTIC TROUBLE CODE (DTC) TABLE)	Possible cause	Correction
00364 Voltage supply terminal 15 Voltage to low		- Check wiring and connections according to wiring diagram - Read measured value block. See MEASURED VALUE BLOCK READING; Display group number 010 - Perform electrical check. See ELECTRICAL CHECK

G00385435

Fig. 38: DTC 00364 Diagnostic
Courtesy of VOLKSWAGEN UNITED STATES, INC.

DTCs 00453 & 00529

V.A.G 1551 print-out (See DIAGNOSTIC TROUBLE CODE (DTC) TABLE)	Possible cause	Correction
00453 Function restriction because of excess temperature	 ATF temperature to high	- Check wiring and connections according to wiring diagram - Read measured value block. See MEASURED VALUE BLOCK READING; Display group number 006 - Perform electrical check. See ELECTRICAL CHECK
00529 RPM information missing (Engine speed)	Wiring open circuit between engine/transmission control modules Wrong or faulty Transmission Control Module (TCM)	- Check wiring and connections according to wiring diagram - Check TCM. See Control Module Identification under VAS 5051 DIAGNOSIS, TESTING AND INFORMATION SYSTEM, CONNECTING AND SELECTING FUNCTION. Replace if necessary. See AUTOMATIC TRANSMISSION CONTROL MODULE (TCM) -J217- under ELECTRICAL/ ELECTRONIC COMPONENT LOCATION
Open circuit/short to Ground[1)] Short to positive [1)] Implausible signal[1)]	Engine speed (RPM) sensor -G28- faulty Wrong or faulty Engine Control Module (ECM)	- Read measured value block. See MEASURED VALUE BLOCK READING; Display group number 001 - Perform electrical check. See ELECTRICAL CHECK - Check ECM.

[1)] One of these displays appears in addition to relevant component.

G00385436

Fig. 39: DTCs 00453 & 00529 Diagnostics
Courtesy of VOLKSWAGEN UNITED STATES, INC.

DTCs 00541 & 00777

V.A.G 1551 print-out (See DIAGNOSTIC TROUBLE CODE (DTC) TABLE)	Possible cause	Correction
00541		- Check wiring and connections according to wiring diagram
ATF temperature	ATF temperature too high	- Read measured value block. See MEASURED VALUE BLOCK READING; Display group number 006 - Perform electrical check. See ELECTRICAL CHECK
upper limit exceeded	ATF level not OK	- Check ATF level: See SERVICING – A/T (09G) article
00777	Can bus connection interrrupted, short circuit	- Check wiring and connections according to wiring diagram
Throttle Position (TP) sensor - G79-	TP sensor -G79- faulty	- Read measured value block. See MEASURED VALUE BLOCK READING; Display group number 003 and 004
No signal No communication		- Check TP sensor: See Appropriate REMOVAL, OVERHAUL & INSTALL article in ENGINE PERFORMANCE

G00385437

Fig. 40: DTCs 00541 & 00777 Diagnostics
Courtesy of VOLKSWAGEN UNITED STATES, INC.

DTCs 01045 & 01166

V.A.G 1551 print-out (See DIAGNOSTIC TROUBLE CODE (DTC) TABLE)	Possible cause	Correction
01045 Tiptronic switch -F189- Implausible signal	Wiring open or short circuit Tiptronic switch -F189- faulty	- Check wiring and connections according to wiring diagram - Read measured value block. See MEASURED VALUE BLOCK READING; Display group number 012 - Replace Tiptronic switch: Manufacturer does not provide specific replacement procedures. For location, see TIPTRONIC SWITCH -F189- under ELECTRICAL/ELECTRONIC COMPONENT LOCATIONS.
01166 Engine torque signal No signal No communication	Faulty wiring between engine/transmission control modules Engine control module gives no signal output	- Check wiring and connections according to wiring diagram - Read ECM DTC memory: SELF-DIAGNOSTICS article in ENGINE PERFORMANCE - Read measured value block. See MEASURED VALUE BLOCK READING; Display group number 012

G00385438

Fig. 41: DTCs 01045 & 01166 Diagnostics
Courtesy of VOLKSWAGEN UNITED STATES, INC.

DTC 01192

V.A.G 1551 print-out See DIAGNOSTIC TROUBLE CODE (DTC) TABLE)	Possible cause	Correction
01192	ATF level not OK Faulty converter	- Checking ATF level: See SERVICING – A/T (09G) article
Torque converter lock-up clutch		- Read measured value block. See MEASURED VALUE BLOCK READING; Display group number 006
Mechanical fault		- Replace solenoid valve 7 -N94-: See SERVICING – A/T (09G) article

G00385439

Fig. 42: DTC 01192 Diagnostic
Courtesy of VOLKSWAGEN UNITED STATES, INC.

DTC 01236

V.A.G 1551 print-out (See DIAGNOSTIC TROUBLE CODE (DTC) TABLE)	Possible cause	Correction
01236	Wiring open circuit or short to Ground or positive	- Check wiring and connections according to wiring diagram
Shift lock solenoid -N110-	Shift lock solenoid -N110- faulty	- Read measured value block. See MEASURED VALUE BLOCK READING; Display group number 008 and 011
Open circuit/short to Ground[1)]		- Perform electrical check. See ELECTRICAL CHECK
Short to positive [1)]		- Replace Shift lock solenoid -N110-: See SERVICING – A/T (09G) article

[1)] One of these displays appears in addition to relevant component.

G00385440

Fig. 43: DTC 01236 Diagnostic
Courtesy of VOLKSWAGEN UNITED STATES, INC.

DTC 01312

V.A.G 1551 print-out (See DIAGNOSTIC TROUBLE CODE (DTC) TABLE)	Possible cause	Correction
01312 Data bus drive	Short circuit between data bus wiring	- Check connector of engine/transmission control modules
	Wiring open circuit or short circuit between engine/transmission control modules	- Perform electrical check. See ELECTRICAL CHECK - Read measured value block. See MEASURED VALUE BLOCK READING; Display group number 125
faulty	Engine Control Module (ECM) faulty	- Check ECM: SELF-DIAGNOSTICS article in ENGINE PERFORMANCE - Replace ECM if necessary
	Transmission Control Module (TCM) faulty	- Replace TCM. See AUTOMATIC TRANSMISSION CONTROL MODULE (TCM) -J217- under ELECTRICAL/ ELECTRONIC COMPONENT LOCATIONS

G00385441

Fig. 44: DTC 01312 Diagnostic
Courtesy of VOLKSWAGEN UNITED STATES, INC.

DTC 01312 & 01314

V.A.G 1551 print-out (See DIAGNOSTIC TROUBLE CODE (DTC) TABLE)	Possible cause	Correction
01312 Engine control module No signal No communication	Open circuit, short to Ground or positive in data bus wiring	- Check data bus wiring and connections using wiring diagram - Read measured value block. See MEASURED VALUE BLOCK READING; Display group number 125
01314 Engine control module Read DTC memory	DTC entry in engine control module	- Perform electrical check. See ELECTRICAL CHECK - Read ECM DTC memory: SELF-DIAGNOSTICS article in ENGINE PERFORMANCE

G00385442

Fig. 45: DTC 01312 & 01314 Diagnostics
Courtesy of VOLKSWAGEN UNITED STATES, INC.

DTC 01316

V.A.G 1551 print-out (See DIAGNOSTIC TROUBLE CODE (DTC) TABLE)	Possible cause	Correction
01316	Ignition has been switched on when connector is disconnected from TCM - J217-	- Check connector of engine/transmission control modules
ABS control module	Wiring open circuit or short to Ground between engine and transmission control modules or ABS and engine control modules	- Perform electrical check. See ELECTRICAL CHECK - Read measured value block. See MEASURED VALUE BLOCK READING; Display group number 125
No signal No communication	Wrong or faulty Transmission Control Module (TCM)	- Check TCM, and replace if necessary. See AUTOMATIC TRANSMISSION CONTROL MODULE (TCM) -J217- under ELECTRICAL/ ELECTRONIC COMPONENT LOCATIONS
	Wrong or faulty ABS control module	- Check ABS control module identification: See appropriate ANTI-LOCK/TRACTION CONTROL article in BRAKES
	Wrong or faulty Engine Control Module (ECM)	- Check ECM, and replace if necessary. See SELF-DIAGNOSTICS article in ENGINE PERFORMANCE

G00385443

Fig. 46: DTC 01316 Diagnostic
Courtesy of VOLKSWAGEN UNITED STATES, INC.

DTCs 01679 & 01680

V.A.G 1551 print-out (See DIAGNOSTIC TROUBLE CODE (DTC) TABLE)	Possible cause	Correction
01679 Speed signal from ABS for front left wheel Implausible signal	Wiring open or short circuit between transmission control module and ABS control module	- Check wiring and connections according to wiring diagram - Perform electrical check. See ELECTRICAL CHECK - Check ABS control module identification: See appropriate ANTI-LOCK/TRACTION CONTROL article in BRAKES
01680 Speed signal from ABS for front right wheel Implausible signal	Wiring open or short circuit between transmission control module and ABS control module	- Check wiring and connections according to wiring diagram - Perform electrical check. See ELECTRICAL CHECK - Check ABS control module identification: See appropriate ANTI-LOCK/TRACTION CONTROL article in BRAKES

G00385444

Fig. 47: DTCs 01679 & 01680 Diagnostics
Courtesy of VOLKSWAGEN UNITED STATES, INC.

DTCs 01681 & 01682

V.A.G 1551 print-out (See DIAGNOSTIC TROUBLE CODE (DTC) TABLE)	Possible cause	Correction
01681 Speed signal from ABS for rear left wheel Implausible signal	Wiring open or short circuit between transmission control module and ABS control module	- Check wiring and connections according to wiring diagram - Perform electrical check. See ELECTRICAL CHECK - Check ABS control module identification: See appropriate ANTI-LOCK/TRACTION CONTROL article in BRAKES
01682 Speed signal from ABS for rear right wheel Implausible signal	Wiring open or short circuit between transmission control module and ABS control module	- Check wiring and connections according to wiring diagram - Perform electrical check. See ELECTRICAL CHECK - Check ABS control module identification: See appropriate ANTI-LOCK/TRACTION CONTROL article in BRAKES

G00387715

Fig. 48: DTCs 01681 & 01682 Diagnostics
Courtesy of VOLKSWAGEN UNITED STATES, INC.

DTC 01683

V.A.G 1551 print-out (See DIAGNOSTIC TROUBLE CODE (DTC) TABLE)	Possible cause	Correction
01683 Wheel speed signals/Vehicle speed Implausible signal	Wiring open or short circuit between transmission control module and ABS control module	- Check wiring and connections according to wiring diagram - Perform electrical check. See ELECTRICAL CHECK - Check ABS control module identification: See appropriate ANTI-LOCK/TRACTION CONTROL article in BRAKES

G00387716

Fig. 49: DTC 01683 Diagnostic
Courtesy of VOLKSWAGEN UNITED STATES, INC.

DTCs 16988 (P0604), 16989 (P0605) & 16997 (P0613)

V.A.G 1551 print-out (See DIAGNOSTIC TROUBLE CODE (DTC) TABLE	Possible cause	Correction
16988 P0604 Control module faulty	Transmission control module -J217- faulty	- Replace transmission control module. See SERVICING – A/T (09G) article
16989 P0605 Control module faulty	Transmission control module -J217- faulty	- Replace transmission control module. See SERVICING – A/T (09G) article
16997 P0613 Control module faulty	Transmission control module -J217- faulty	- Replace transmission control module. See SERVICING – A/T (09G) article

Until the possible cause of the fault has been determined and the following faults have been corrected:

- *mechanical faults*
- *hydraulic faults*
- *or all affected electrical/electronic components and cable connections*

The Transmission Control Module (TCM) -J217- should not be replaced. See SERVICING – A/T (09G) article.

G00387717

Fig. 50: DTCs 16988 (P0604), 16989 (P0605) & 16997 (P0613) Diagnostics
Courtesy of VOLKSWAGEN UNITED STATES, INC.

DTC 17084 (P0700)

V.A.G 1551 print-out (See DIAGNOSTIC TROUBLE CODE (DTC) TABLE)	Possible cause	Correction
17084 P0700 Control module faulty	Transmission Control Module (TCM) -J217- faulty	- Replace TCM. See SERVICING – A/T (09G) article

Until the possible cause of the fault has been determined and the following faults have been corrected:

- *mechanical faults*
- *hydraulic faults*
- *or all affected electrical/electronic components and cable connections*

the Transmission Control Module (TCM) -J217- should not be replaced. See SERVICING – A/T (09G) article.

G00387718

Fig. 51: DTC 17084 (P0700) Diagnostic
Courtesy of VOLKSWAGEN UNITED STATES, INC.

DTC 17089 (P0705) & 17090 (P0706)

V.A.G 1551 print-out (See DIAGNOSTIC TROUBLE CODE (DTC) TABLE)	Possible cause	Correction
17089 P0705 Driving range sensor => -F125- Fault in electrical circuit	Open circuit or short to Ground/positive Multi-function TR switch -F125- faulty	- Check wiring and connections according to wiring diagram [1)] - Read measured value block. See MEASURED VALUE BLOCK READING; Display group number 009 and 013 - Perform electrical check from. See ELECTRICAL CHECK - Replace Multi-function TR switch -F125-. See SERVICING – A/T (09G) article
17090 P0706 Driving range sensor => -F125- [1)] Implausible signal	Open circuit or short to Ground/positive Multi-function TR switch -F125- faulty	- Check wiring and connections according to wiring diagram [1)] - Read measured value block. See MEASURED VALUE BLOCK READING; Display group number 009 and 013 - Perform electrical check from. See ELECTRICAL CHECK - Replace Multi-function TR switch -F125-. See SERVICING – A/T (09G) article

[1)] The driving range sensor -F125 is the Multi-function Transmission Range (TR) switch -F125-.

G00387719

Fig. 52: DTC 17089 (P0705) & 17090 (P0706) Diagnostics
Courtesy of VOLKSWAGEN UNITED STATES, INC.

DTC 17095 (P0711)

V.A.G 1551 print-out (See DIAGNOSTIC TROUBLE CODE (DTC) TABLE)	Possible cause	Correction
17095 P0711 Transmission fluid temperature sensor -G93- Implausible signal	Open circuit or short to Ground/positive Transmission fluid temperature sensor - G93- faulty	- Check wiring and connections according to wiring diagram - Read measured value block. See MEASURED VALUE BLOCK READING; Display group number 006 - Perform electrical check. See ELECTRICAL CHECK

G00387720

Fig. 53: DTC 17095 (P0711) Diagnostic
Courtesy of VOLKSWAGEN UNITED STATES, INC.

DTCs 17096 (P0712) & 17097 (P0713)

V.A.G 1551 print-out (See DIAGNOSTIC TROUBLE CODE (DTC) TABLE)	Possible cause	Correction
17096 P0712 Transmission fluid temperature sensor -G93- Signal too small	Wiring open circuit or short to Ground Transmission fluid temperature sensor - G93- faulty	- Check wiring and connections according to wiring diagram - Read measured value block. See MEASURED VALUE BLOCK READING; Display group number 006 - Perform electrical check from. See ELECTRICAL CHECK
17097 P0713 Transmission fluid temperature sensor -G93- Signal too high	Wiring open circuit or short to positive Transmission fluid temperature sensor - G93- faulty	- Check wiring and connections according to wiring diagram - Read measured value block. See MEASURED VALUE BLOCK READING; Display group number 006 - Perform electrical check from. See ELECTRICAL CHECK

G00387721

Fig. 54: DTCs 17096 (P0712) & 17097 (P0713) Diagnostics
Courtesy of VOLKSWAGEN UNITED STATES, INC.

DTC 17099 (P0715)

V.A.G 1551 print-out (See DIAGNOSTIC TROUBLE CODE (DTC) TABLE)	Possible cause	Correction
17099 P0715 Sensor for transmission RPM -G182- Fault in electrical circuit	Wiring open circuit or short to Ground or positive Sensor for transmission RPM -G182- faulty	- Check wiring and connections according to wiring diagram - Read measured value block. See MEASURED VALUE BLOCK READING; Display group number 001 - Perform electrical check from. See ELECTRICAL CHECK - Replace Sensor for transmission RPM -G182-: See SERVICING – A/T (09G) article
	ATF level not OK faulty converter	- Check ATF level: See SERVICING – A/T (09G) article
	Clutches or brakes are slipping	- Read measured value block. See MEASURED VALUE BLOCK READING; Display group number 006 and check which elements are faulty or not active

G00387722

Fig. 55: DTC 17099 (P0715) Diagnostic
Courtesy of VOLKSWAGEN UNITED STATES, INC.

DTC 17100 (P0716)

V.A.G 1551 print-out (See DIAGNOSTIC TROUBLE CODE (DTC) TABLE)	Possible cause	Correction
17100 P0716 Sensor for transmission RPM -G182- Implausible signal	Wiring open circuit or short to Ground or positive Sensor for transmission RPM -G182- faulty	- Check wiring and connections according to wiring diagram - Read measured value block. See MEASURED VALUE BLOCK READING; Display group number 001 - Perform electrical check from. See ELECTRICAL CHECK - Replace Sensor for transmission RPM -G182-: See SERVICING – A/T (09G) article
	ATF level not OK faulty converter	- Check ATF level: See SERVICING – A/T (09G) article
	Clutches or brakes are slipping	- Read measured value block. See MEASURED VALUE BLOCK READING; Display group number 006 and check which elements are faulty or not active when driving

G00387723

Fig. 56: DTC 17100 (P0716) Diagnostic
Courtesy of VOLKSWAGEN UNITED STATES, INC.

DTC 17101 (P0717)

V.A.G 1551 print-out (See DIAGNOSTIC TROUBLE CODE (DTC) TABLE)	Possible cause	Correction
17101 P0717	Wiring open circuit or short to Ground or positive	- Check wiring and connections according to wiring diagram
Sensor for transmission RPM -G182-	Transmission input speed sensor -G182- faulty	- Read measured value block. See MEASURED VALUE BLOCK READING; Display group number 001 - Perform electrical check. See ELECTRICAL CHECK - Replace Sensor for transmission RPM -G182-: See SERVICING – A/T (09G) article
No signal	ATF level not OK faulty converter	- Check ATF level: See SERVICING – A/T (09G) article
	Clutches or brakes are slipping	- Read measured value block. See MEASURED VALUE BLOCK READING; Display group number 006 and check which elements are faulty or not active when driving

G00387724

Fig. 57: DTC 17101 (P0717) Diagnostic
Courtesy of VOLKSWAGEN UNITED STATES, INC.

DTC 17105 (P0721)

V.A.G 1551 print-out (See DIAGNOSTIC TROUBLE CODE (DTC) TABLE)	Possible cause	Correction
17105 P0721 Sender for transmission output RPM -G195-	Open circuit or short to Ground/positive Sender for transmission output RPM -G195- faulty Engine or gear output signal transmission is faulty	- Check wiring and connections according to wiring diagram [1)] - Read measured value block. See - Read measured value block. See MEASURED VALUE BLOCK READING; Display group number 001 - Perform electrical check. See ELECTRICAL CHECK - Replace Sender for transmission output RPM -G195-. See SERVICING – A/T (09G) article
Implausible signal	ATF level not OK faulty converter	- Checking ATF level: See SERVICING – A/T (09G) article
	Clutches or brakes are slipping Valve body or solenoid valve faulty	- Read measured value block. See MEASURED VALUE BLOCK READING; Display group number 006 - Replace individual valves or valve body, if necessary: See SERVICING – A/T (09G) article

[1)] First check connectors for contact corrosion or water entry, replace if necessary.

G00387725

Fig. 58: DTC 17105 (P0721) Diagnostic
Courtesy of VOLKSWAGEN UNITED STATES, INC.

DTC 17109 (P0725)

V.A.G 1551 print-out (See DIAGNOSTIC TROUBLE CODE (DTC) TABLE)	Possible cause	Correction
17109 P0725 Speed signal from engine control module	Wiring open circuit between engine/transmission control modules Wrong or faulty transmission control module	- Check wiring and connections according to wiring diagram - Check transmission control module. See Control Module Identification under CONNECTING AND SELECTING FUNCTION, - Replace if necessary. See AUTOMATIC TRANSMISSION CONTROL MODULE (TCM) -J217- under ELECTRICAL/ELECTRONIC COMPONENT LOCATIONS - Read measured value block. See MEASURED VALUE BLOCK READING; Display group number 001 - Perform electrical check from. See ELECTRICAL CHECK
Fault in electrical circuit	Engine speed (RPM) sensor -G28- faulty Wrong or faulty engine control module	- Check engine control module, and replace if necessary. See appropriate REMOVE, OVERHAUL & INSTALL article in ENGINE PERFORMANCE

G00387726

Fig. 59: DTC 17109 (P0725) Diagnostic
Courtesy of VOLKSWAGEN UNITED STATES, INC.

DTC 17113 (P0729)

V.A.G 1551 print-out (See DIAGNOSTIC TROUBLE CODE (DTC) TABLE)	Possible cause	Correction
17113 P0729 6th gear wrong demultiplication ratio	Clutch of indicated gear is slipping or is faulty Solenoid valve of this gear is dirty or faulty	- Refer to clutch logic or solenoid valve logic: See appropriate OVERHAUL article
wrong demultiplication ratio	Transmission vehicle speed sensor -G38- faulty	- Correct faults according to DTC 00297
	Sensor for transmission RPM -G182- faulty	- Correct faults according to DTC 17101
	Wrong or faulty transmission control module	- Check transmission control module. See Control Module Identification under CONNECTING AND SELECTING FUNCTION, - Replace if necessary. See AUTOMATIC TRANSMISSION CONTROL MODULE (TCM) -J217- under ELECTRICAL/ELECTRONIC

G00387727

Fig. 60: DTC 17113 (P0729) Diagnostic
Courtesy of VOLKSWAGEN UNITED STATES, INC.

DTC 17114 (P07390)

V.A.G 1551 print-out (See DIAGNOSTIC TROUBLE CODE (DTC) TABLE)	Possible cause	Correction
17114 P0730	ATF level not OK faulty converter	- Check ATF level: See SERVICING – A/T (09G) article
Gear/demultiplication control	Clutch slips/is faulty or solenoid valves are dirty or faulty	- Read measured value block (display group number 007). See MEASURED VALUE BLOCK READING
	Wiring open circuit or short to Ground or positive	- Check wiring and connections according to wiring diagram - Perform electrical check. See ELECTRICAL CHECK
wrong demultiplication ratio	Sender for transmission output RPM -G195- faulty	- Correct faults according to DTC 17105
	Sensor for transmission RPM -G182- faulty Wrong or faulty transmission control module	- Correct faults according to DTC 17101 - Check transmission control module. See Control Module Identification under CONNECTING AND SELECTING FUNCTION, - Replace if necessary. See AUTOMATIC TRANSMISSION CONTROL MODULE (TCM) -J217- under ELECTRICAL/ELECTRONIC COMPONENT LOCATIONS

G00387728

Fig. 61: DTC 17114 (P07390) Diagnostic
Courtesy of VOLKSWAGEN UNITED STATES, INC.

DTC 17115 (P0731)

V.A.G 1551 print-out (See DIAGNOSTIC TROUBLE CODE (DTC) TABLE)	Possible cause	Correction
17115 P0731 1st gear	Clutch of indicated gear is slipping or is faulty Solenoid valve of this gear is dirty or faulty	- Refer to clutch logic or solenoid valve logic: See appropriate OVERHAUL article
wrong demultiplication ratio	Transmission output speed sensor -G195- faulty	- Correct faults according to DTC 17105
	Sensor for transmission RPM -G182- faulty	- Correct faults according to DTC 17101
	Wrong or faulty transmission control module	- Check transmission control module. See Control Module Identification under CONNECTING AND SELECTING FUNCTION, - Replace if necessary. See AUTOMATIC TRANSMISSION CONTROL MODULE (TCM) -J217- under ELECTRICAL/ELECTRONIC COMPONENT LOCATIONS

G00387729

Fig. 62: DTC 17115 (P0731) Diagnostic
Courtesy of VOLKSWAGEN UNITED STATES, INC.

DTC 17116 (P0732)

V.A.G 1551 print-out (See DIAGNOSTIC TROUBLE CODE (DTC) TABLE)	Possible cause	Correction
17116 P0732 2nd gear	Clutch of indicated gear is slipping or is faulty Solenoid valve of this gear is dirty or faulty	- Refer to clutch logic or solenoid valve logic: See appropriate OVERHAUL article
wrong demultiplication ratio	Sender for transmission output RPM - G195- faulty	- Correct faults according to DTC 17105
	Sensor for transmission RPM -G182- faulty	- Correct faults according to DTC 17101
	Wrong or faulty transmission control module	- Check transmission control module. See Control Module Identification under CONNECTING AND SELECTING FUNCTION, - Replace if necessary. See AUTOMATIC TRANSMISSION CONTROL MODULE (TCM) - J217- under ELECTRICAL/ELECTRONIC COMPONENT LOCATIONS

G00387730

Fig. 63: DTC 17116 (P0732) Diagnostic
Courtesy of VOLKSWAGEN UNITED STATES, INC.

DTC 17117 (P0733)

V.A.G 1551 print-out (See DIAGNOSTIC TROUBLE CODE (DTC) TABLE)	Possible cause	Correction
17117 P0733 3rd gear	Clutch of indicated gear is slipping or is faulty Solenoid valve of this gear is dirty or faulty	- Refer to clutch logic or solenoid valve logic: See appropriate OVERHAUL article
wrong demultiplication ratio	Sender for transmission output RPM -G182- faulty	- Correct faults according to DTC 17105
	Sensor for transmission RPM -G182- faulty	- Correct faults according to DTC 17101
	Wrong or faulty transmission control module	- Check transmission control module. See Control Module Identification under CONNECTING AND SELECTING FUNCTION, - Replace if necessary. See AUTOMATIC TRANSMISSION CONTROL MODULE (TCM) -J217- under ELECTRICAL/ELECTRONIC COMPONENT LOCATIONS

G00387731

Fig. 64: DTC 17117 (P0733) Diagnostic
Courtesy of VOLKSWAGEN UNITED STATES, INC.

DTC 17118 (P0734)

V.A.G 1551 print-out (See DIAGNOSTIC TROUBLE CODE (DTC) TABLE)	Possible cause	Correction
17118 P0734 4th gear	Clutch of indicated gear is slipping or is faulty Solenoid valve of this gear is dirty or faulty	- Refer to clutch logic or solenoid valve logic: See appropriate OVERHAUL article
wrong demultiplication ratio	Sender for transmission output RPM -G195- faulty	- Correct faults according to DTC 17105
	Sender for transmission RPM -G182- faulty	- Correct faults according to DTC 17101
	Wrong or faulty transmission control module	- Check transmission control module. See Control Module Identification under CONNECTING AND SELECTING FUNCTION, - Replace if necessary. See AUTOMATIC TRANSMISSION CONTROL MODULE (TCM) -J217- under ELECTRICAL/ELECTRONIC COMPONENT LOCATIONS

G00387732

Fig. 65: DTC 17118 (P0734) Diagnostic
Courtesy of VOLKSWAGEN UNITED STATES, INC.

DTC 17119 (P0735)

V.A.G 1551 print-out (See DIAGNOSTIC TROUBLE CODE (DTC) TABLE)	Possible cause	Correction
17119 P0735 5th gear	Clutch of indicated gear is slipping or is faulty Solenoid valve of this gear is dirty or faulty	- Refer to clutch logic or solenoid valve logic: See appropriate OVERHAUL article
wrong demultiplication ratio	Sender for transmission output RPM - G195- faulty	- Correct faults according to DTC 17105
	Sensor for transmission RPM -G182- faulty	- Correct faults according to DTC 17101
	Wrong or faulty transmission control module	- Check transmission control module. See Control Module Identification under CONNECTING AND SELECTING FUNCTION, - Replace if necessary. See AUTOMATIC TRANSMISSION CONTROL MODULE (TCM) - J217- under ELECTRICAL/ELECTRONIC COMPONENT LOCATIONS

G00387733

Fig. 66: DTC 17119 (P0735) Diagnostic
Courtesy of VOLKSWAGEN UNITED STATES, INC.

DTC 17132 (P0748)

V.A.G 1551 print-out (See DIAGNOSTIC TROUBLE CODE (DTC) TABLE)	Possible cause	Correction
17132 P0748	Wiring open circuit or short to Ground	- Check wiring and connections according to wiring diagram
Pressure control valve 1 -N215- Fault in electrical circuit	Pressure control valve 1 -N215-[1] faulty	- Read measured value block. See MEASURED VALUE BLOCK READING; Display group number 005 - Perform electrical check. See ELECTRICAL CHECK

[1] The Pressure control valve 1 -N215- is also called Solenoid valve 4 -N91-.

G00387734

Fig. 67: DTC 17132 (P0748) Diagnostic
Courtesy of VOLKSWAGEN UNITED STATES, INC.

DTCs 17135 (P0751) & 17136 (P0752)

V.A.G 1551 print-out (See DIAGNOSTIC TROUBLE CODE (DTC) TABLE)	Possible cause	Correction
17135 P0751	Wiring open circuit or short to Ground	- Check wiring and connections according to wiring diagram
Switch valve 1 Solenoid valve 1 -N88- Open circuit/short to Ground	Solenoid valve 1 -N88- faulty	- Perform electrical check. See ELECTRICAL CHECK
17136 P0752	Wiring open circuit or short to positive	- Check wiring and connections according to wiring diagram [1]
Switch valve 1 Solenoid valve 1 -N88- Short to positive	Solenoid valve 1 -N88- faulty	- Perform electrical check. See ELECTRICAL CHECK

G00387735

Fig. 68: DTCs 17135 (P0751) & 17136 (P0752) Diagnostics

Courtesy of VOLKSWAGEN UNITED STATES, INC.

DTCs 17137 (P0753) & 17140 (P0756)

V.A.G 1551 print-out (See DIAGNOSTIC TROUBLE CODE (DTC) TABLE)	Possible cause	Correction
17137 P0753 Switch valve 1 Solenoid valve 1 -N88- Fault in electrical circuit	Open circuit or short to Ground/positive Solenoid valve 1 -N88- faulty	- Check wiring and connections according to wiring diagram - Perform electrical check. See ELECTRICAL CHECK
17140 P0756 Switch valve 2 Solenoid valve 2 -N89- Open circuit/short to	Wiring open circuit or short to Ground Solenoid valve 2 -N89- faulty	- Check wiring and connections according to wiring diagram - Perform electrical check. See ELECTRICAL CHECK

G00387736

Fig. 69: DTCs 17137 (P0753) & 17140 (P0756) Diagnostics
Courtesy of VOLKSWAGEN UNITED STATES, INC.

DTCs 17141 (P0757) & 17142 (P0758)

V.A.G 1551 print-out (See DIAGNOSTIC TROUBLE CODE (DTC) TABLE)	Possible cause	Correction
17141 P0757 Switch valve 2 Solenoid valve 2 - N89- Short to positive	Wiring open circuit or short to positive Solenoid valve 2 -N89- faulty	- Check wiring and connections according to wiring diagram - Perform electrical check. See ELECTRICAL CHECK
17142 P0758 Switch valve 2 Solenoid valve 2 -N89- Fault in electrical	Open circuit or short to Ground/positive Solenoid valve 2 -N89- faulty	- Check wiring and connections according to wiring diagram - Perform electrical check. See ELECTRICAL CHECK

G00387737

Fig. 70: DTCs 17141 (P0757) & 17142 (P0758) Diagnostics
Courtesy of VOLKSWAGEN UNITED STATES, INC.

DTC 17182 (P0798)

V.A.G 1551 print-out (See DIAGNOSTIC TROUBLE CODE (DTC) TABLE)	Possible cause	Correction
17182 P0798 Pressure control valve 3 -N217- Fault in electrical circuit	Wiring open circuit or short to Ground Pressure control valve 3 -N217- [1] faulty	- Check wiring and connections according to wiring diagram - Read measured value block. See MEASURED VALUE BLOCK READING; Display group number 005 - Perform electrical check. See ELECTRICAL CHECK

[1] The Pressure control valve 3 -N217- is also called Solenoid valve 6 -N93-.

G00387738

Fig. 71: DTC 17182 (P0798) Diagnostic
Courtesy of VOLKSWAGEN UNITED STATES, INC.

DTC 17195 (P0811)

V.A.G 1551 print-out (See DIAGNOSTIC TROUBLE CODE (DTC) TABLE)	Possible cause	Correction
17195 P0811	ATF level not OK	- Check ATF level: See SERVICING – A/T (09G) article
	faulty converter	
heavy clutch slip		- Read measured value block. See MEASURED VALUE BLOCK READING; Display group number 006
		- Replace solenoid valve 7 -N94-: See SERVICING - A/T (09G) article

G00387739

Fig. 72: DTC 17195 (P0811) Diagnostic
Courtesy of VOLKSWAGEN UNITED STATES, INC.

DTCs 17224 (P0840) & 17225 (P0841)

V.A.G 1551 print-out (See DIAGNOSTIC TROUBLE CODE (DTC) TABLE)	Possible cause	Correction
17224 P0840 Transmission hydraulic pressure sensor 1 Mechanical fault	Sender -1- for hydraulic pressure -G193- faulty	- Perform electrical check. See ELECTRICAL CHECK - Replace Sender -1- for hydraulic pressure -G193-: See SERVICING – A/T (09G) article
17225 P0841 Transmission hydraulic pressure sensor 1 Implausible signal	Wiring open or short circuit Sender -1- for hydraulic pressure -G193- faulty	- Check wiring and connections according to wiring diagram - Perform electrical check. See ELECTRICAL CHECK - Replace Sender -1- for hydraulic pressure -G193-: See SERVICING – A/T (09G) article

G00387740

Fig. 73: DTCs 17224 (P0840) & 17225 (P0841) Diagnostics
Courtesy of VOLKSWAGEN UNITED STATES, INC.

DTC 17226 (P0842)

V.A.G 1551 print-out (See DIAGNOSTIC TROUBLE CODE (DTC) TABLE)	Possible cause	Correction
17226 P0842 Transmission hydraulic pressure sensor 1 Short to Ground	Wiring short circuit Sender -1- for hydraulic pressure -G193- faulty	- Check wiring and connections according to wiring diagram - Perform electrical check. See ELECTRICAL CHECK - Replace Sender -1- for hydraulic pressure -G193-: See SERVICING – A/T (09G) article

G00387741

Fig. 74: DTC 17226 (P0842) Diagnostic
Courtesy of VOLKSWAGEN UNITED STATES, INC.

DTCs 17299 (P0845) & 17230 (P0846)

V.A.G 1551 print-out (See DIAGNOSTIC TROUBLE CODE (DTC) TABLE)	Possible cause	Correction
17299 P0845 Transmission hydraulic pressure sensor 2 Mechanical fault	Sender -2- for hydraulic pressure -G194- faulty	- Perform electrical check. See ELECTRICAL CHECK - Replace Sender -2- for hydraulic pressure -G194-: See SERVICING – A/T (09G) article
17230 P0846 Transmission hydraulic pressure sensor 2 Implausible signal	Wiring open or short circuit Sender -2- for hydraulic pressure -G194- faulty	- Check wiring and connections according to wiring diagram - Perform electrical check. See ELECTRICAL CHECK - Replace Sender -2- for hydraulic pressure -G194-: See SERVICING – A/T (09G) article

G00387742

Fig. 75: DTCs 17299 (P0845) & 17230 (P0846) Diagnstics
Courtesy of VOLKSWAGEN UNITED STATES, INC.

DTC 17231 (P0847)

V.A.G 1551 print-out (See DIAGNOSTIC TROUBLE CODE (DTC) TABLE)	Possible cause	Correction
17231 P0847 Transmission hydraulic pressure sensor 2 Short to Ground	Wiring short circuit Sender -2- for hydraulic pressure -G194- faulty	- Check wiring and connections according to wiring diagram - Perform electrical check. See ELECTRICAL CHECK - Replace Sender -2- for hydraulic pressure -G194-: See SERVICING – A/T (09G) article

G00387743

Fig. 76: DTC 17231 (P0847) Diagnostic
Courtesy of VOLKSWAGEN UNITED STATES, INC.

DTC 17968 (P1560)

Maximum Engine RPM Surpassed

- Check and erase DTC memory of Motronic Engine Control Module (ECM) -J220- (ECM). See appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE.
- Repair mechanical damage

DTCs (P00864), 18010 (P01602) & 18255 (P1847)

V.A.G 1551 print-out (See DIAGNOSTIC TROUBLE CODE (DTC) TABLE)	Possible cause	Correction
P0864 Engine control module Read DTC memory	• Fault entry in Engine Control Module (ECM)	- Perform electrical check. See ELECTRICAL CHECK - Read ECM DTC memory: See appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE.
18010 P1602 Voltage supply terminal 30 Voltage too low	• Battery empty • Wiring open circuit	- Check battery - Read measured value block. See MEASURED VALUE BLOCK READING; Display group number 008 - Check wiring and connections according to wiring diagram
18255 P1847 Read DTC memory of ABS control module	• Fault in DTC memory of ABS control module • ABS control module faulty	- Check DTC memory of ABS control module: See appropriate ANTI-LOCK article in BRAKES

G00387744

Fig. 77: DTCs (P00864), 18010 (P01602) & 18255 (P1847) Diagnostics
Courtesy of VOLKSWAGEN UNITED STATES, INC.

DTC 18554 (P2122)

V.A.G 1551 print-out (See DIAGNOSTIC TROUBLE CODE (DTC) TABLE)	Possible cause	Correction
18554 P2122 Throttle Position (TP) sensor -G79- Signal too small	Wiring open or short circuit between TP sensor -G79- and Engine Control Module (ECM)	- Check wiring and connections according to wiring diagram [1] - Read measured value block. See MEASURED VALUE BLOCK READING; Display group number 008 and 009
	Throttle Position (TP) sensor -G79- faulty	- Read DTC memory of ECM and correct faults: See appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE. - Replace ECM if necessary
	Wrong or faulty Transmission Control Module (TCM)	- Check transmission control module. See Control Module Identification under CONNECTING AND SELECTING FUNCTION, - Replace if necessary. See AUTOMATIC TRANSMISSION CONTROL MODULE (TCM) -J217- under ELECTRICAL/ELECTRONIC COMPONENT LOCATIONS

[1] First check connectors for contact corrosion or water entry and replace if necessary.

G00387745

Fig. 78: DTC 18554 (P2122) Diagnostic
Courtesy of VOLKSWAGEN UNITED STATES, INC.

DTCs 19146 (P2714), 19147 (P2715) & 19148 (P2716)

V.A.G 1551 print-out (See DIAGNOSTIC TROUBLE CODE (DTC) TABLE)	Possible cause	Correction
19146 P2714 Pressure control valve 4 -N218- Open circuit/short to Ground	Wiring open circuit or short to Ground Pressure control valve 4 -N218 - [1]faulty	- Check wiring and connections according to wiring diagram - Perform electrical check. See ELECTRICAL CHECK
19147 P2715 Pressure control valve 4 -N218- Short to positive	Short to positive Pressure control valve 4 -N218- [1]faulty	- Check wiring and connections according to wiring diagram - Perform electrical check. See ELECTRICAL CHECK
19148 P2716 Pressure control valve 4 -N218- Fault in electrical	Pressure control valve 4 -N218- [1]faulty	- Check wiring and connections according to wiring diagram - Perform electrical check. See ELECTRICAL CHECK

[1] The Pressure control valve 4 -N218- is also called Solenoid valve 7 -N94-.

G00387746

Fig. 79: DTCs 19146 (P2714), 19147 (P2715) & 19148 (P2716) Diagnostics
Courtesy of VOLKSWAGEN UNITED STATES, INC.

DTCs 19155 (P2723), 19156 (P2724) & 19157 (P2725)

V.A.G 1551 print-out (See DIAGNOSTIC TROUBLE CODE (DTC) TABLE)	Possible cause	Correction
19155 P2723 Pressure control valve 5 -N233- Open circuit/short to Ground	Wiring open circuit or short to Ground Pressure control valve 5 -N233- [1]faulty	- Check wiring and connections according to wiring diagram - Read measured value block. See MEASURED VALUE BLOCK READING; Display group number 007 - Perform electrical check. See ELECTRICAL CHECK
19156 P2724 Pressure control valve 5 -N233- Short to positive	Short to positive Pressure control valve 5 -N233- [1]faulty	- Check wiring and connections according to wiring diagram - Read measured value block. See MEASURED VALUE BLOCK READING; Display group number 007 - Perform electrical check. See ELECTRICAL CHECK
19157 P2725 Pressure control valve 5 -N233- Fault in electrical circuit	Pressure control valve 5 -N233- [1]faulty	- Check wiring and connections according to wiring diagram - Read measured value block. See MEASURED VALUE BLOCK READING; Display group number 007 - Perform electrical check. See ELECTRICAL CHECK

[2] The Pressure control valve 5 -N233- is also called Solenoid valve 3 -N90-.

G00387747

Fig. 80: DTCs 19155 (P2723), 19156 (P2724) & 19157 (P2725) Diagnostics
Courtesy of VOLKSWAGEN UNITED STATES, INC.

DTCs 19164 (P2732), 19165 (P2733) & 19166 (P2734)

V.A.G 1551 print-out (See DIAGNOSTIC TROUBLE CODE (DTC) TABLE)	Possible cause	Correction
19164 P2732 Pressure control valve 6 -N271- Open circuit/short to Ground	Wiring open circuit or short to Ground Pressure control valve 6 -N271 - [1]faulty	- Check wiring and connections according to wiring diagram - Read measured value block. See MEASURED VALUE BLOCK READING; Display group number 007 Perform electrical check. See ELECTRICAL CHECK
19165 P2733 Pressure control valve 6 -N271- Short to positive	Short to positive Pressure control valve 6 -N271 - [1]faulty	- Check wiring and connections according to wiring diagram - Read measured value block. See MEASURED VALUE BLOCK READING; Display group number 007 Perform electrical check. See ELECTRICAL CHECK
19166 P2734 Pressure control valve 6 -N271- Fault in electrical circuit	Pressure control valve 6 -N271 - [1]faulty	- Check wiring and connections according to wiring diagram - Read measured value block. See MEASURED VALUE BLOCK READING; Display group number 007 Perform electrical check. See ELECTRICAL CHECK

[1] The Pressure control valve 6 -N271- is also called Solenoid valve 10 -N283-.

G00387748

Fig. 81: DTCs 19164 (P2732), 19165 (P2733) & 19166 (P2734) Diagnostics
Courtesy of VOLKSWAGEN UNITED STATES, INC.

DTC 65535

V.A.G 1551 print-out (See DIAGNOSTIC TROUBLE CODE (DTC) TABLE)	Possible cause	Correction
65535 Control module faulty	Transmission Control Module (TCM) -J217- faulty	- Replace TCM -J217-. See AUTOMATIC TRANSMISSION CONTROL MODULE (TCM) -J217- under ELECTRICAL/ELECTRONIC COMPONENT LOCATIONS

Until the possible cause of the fault has been determined and the following faults have been corrected:

- *mechanical faults*
- *hydraulic faults*
- *or all affected electrical/electronic components and cable connections*

The TCM -J217- should not be replaced. See AUTOMATIC TRANSMISSION CONTROL MODULE (TCM) -J217- under ELECTRICAL/ELECTRONIC COMPONENT LOCATIONS .

G00387749

Fig. 82: DTC 65535 Diagnostic
Courtesy of VOLKSWAGEN UNITED STATES, INC.

BASIC SETTING, INITIATING

Basic setting must be performed after the following repairs:

- Replacing engine control module
- Replacing throttle valve control module
- Replacing transmission control module
- Replacing throttle position (accelerator pedal position) sensor

Connect VAS 5051 tester and select functions. See **VAS 5051 DIAGNOSIS, TESTING AND INFORMATION SYSTEM, CONNECTING AND SELECTING FUNCTION** .

The Following Description Refers To V.A.G 1551 Scan Tool

Indicated on display:

- Rapid data transfer HELP
- Select function XX

Press keys 0 and 4. (04 selects function "Initiating basic setting").

NOTE: Accelerator pedal must remain at idling speed position.

Indicated on display:

- Rapid data transfer Q
- 04 - Basic setting

Confirm entry with Q key.

Indicated on display:

- Basic setting
- Input display group number XXX

Press keys 0, 0 and 1.

Confirm entry with Q key.

Indicated on display:

- System in basic setting 0 "right arrow"

The system is now in basic setting.

DIAGNOSTIC TROUBLE CODE (DTC) MEMORY, ERASING

Connect VAS 5051 tester and select functions. See **VAS 5051 DIAGNOSIS, TESTING AND INFORMATION SYSTEM, CONNECTING AND SELECTING FUNCTION** .

NOTE: The following description refers To V.A.G 1551.

Requirement

DTC memory is checked. See **DIAGNOSTIC TROUBLE CODE (DTC) MEMORY, CHECKING** .

After DTC Memory Has Been Successfully Checked

Indicated on display:

- Rapid data transfer HELP
- Select function XX

Press keys 0 and 5 (05 selects function "Erase DTC memory").

Indicated on display:

- Rapid data transfer Q
- 05 Erase DTC memory

Confirm entry with Q key.

Adherence to the sequence of operations was not maintained if the following is indicated on display:

- Warning!
- DTC memory was not checked

At first the DTC memory must be checked (read).

NOTE: If the ignition was switched off (e.g. between interrogating the fault memory and erasing fault memory), the fault memory is then not erased.

DTC memory will be erased approx. 5 seconds after the following display appears.

- Rapid data transfer "right arrow"
- DTC memory is erased!

The DTC memory is now erased. Wait about 1 minute before again checking DTC memory.

Transmission Control Module (TCM) -J217- was not given sufficient time to recognize DTCs if the following display appears: "System cannot be checked", print out with printer switched on:

- 1 DTC recognized!
- 00811 3333
- System cannot be checked

Wait about 1 minute before again checking DTC memory.

After checking and erasing DTC memory, perform a test drive and again check DTC memory.

When checking the DTC memory the display must contain this message:

- No DTCs recognized

TRANSMISSION CONTROL MODULE (TCM) -J217-, CODING

There is no special code required for the New Beetle convertible.

MEASURED VALUE BLOCK, READING

Supplementary information

- Electrical Wiring Diagrams

NOTE: The following description refers to V.A.G 1551.

Test Sequence

Connect VAS 5051 tester and select functions. See **VAS 5051 DIAGNOSIS, TESTING AND INFORMATION SYSTEM, CONNECTING AND SELECTING FUNCTION** .

Indicated on display:

- Rapid data transfer HELP
- Select function XX

Press keys 0 and 8 (08 selects function "Read measured value block").

Indicated on display:

- Rapid data transfer Q
- 08 - Read measured value block

Confirm entry with Q key.

Indicated on display:

- Read measured value (data) block
- Input display group number XXX

Enter display group number For list of selectable display group numbers, see **List Of Selectable Display Group Numbers** .

Confirm entry with Q key.

There are always 4 display zones in the measured value block (arrows) (if necessary in physical quantities).

- Read measured value block 1 "right arrow"
- "right arrow"
- 1 "right arrow" 2 "right arrow" 3 "right arrow" 4

To decode the individual values in display zones 1 to 4. See **TEST TABLE** .

List Of Selectable Display Group Numbers

Indicated on display (example)			
Display zones: **1 2 3 4**	**Display group No.**	**Display zone**	**Designation**
Read measured value block 1 **810 rpm 780 rpm 0 rpm P**	001	1 2 3 4	Engine speed Sensor for transmission RPM -G182- Sender for transmission output RPM -G195- Gear selected
Read measured value block 2 **780 rpm 0.700 V 0 rpm 0.600 V**	002	1 2 3 4	Sensor for transmission RPM -G182- Voltage at Sensor for transmission RPM -G182- Sender for transmission output RPM -G195- Voltage at Sender for transmission output RPM -G195-
Read measured value block 3 **DS 0.0 % 0 rpm R**	003	1 2 3 4	Driving mode Accelerator pedal position Vehicle speed Gear selected
Read measured value block 4 **D 0.0 % Level 1H**	004	1 2 3 4	Selector lever position Accelerator pedal position Gradients Gear selected

G00387750

Fig. 83: Selectable Display Group 001-004
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Indicated on display (example)			
Display zones: **1 2 3 4**	**Display group No.**	**Display zone**	**Designation**
Read measured value block 5 **5.0 % 76.4 % 0.0 % 0.0 %**	005	1 2 3 4	Hill factor Throttle valve factor Dynamic code Accelerator pedal position
Read measured value block 6 **71 C 0.200 A 0 0/min**	006	1 2 3 4	ATF temperature Specified current of Solenoid valve 4 -N91- Torque converter lock-up clutch Converter slip speed
Read measured value block 7 **0.100 0.100 A 0.100 A 0.100 A**	007	1 2 3 4	Solenoid valve 5 -N92- Solenoid valve 9 -N282- Solenoid valve 3 -N90- Solenoid valve 10 -N283-
Read measured value block 8 **0.960 A 0.200 A 00000000 13.8 V**	008	1 2 3 4	Solenoid valve 6 -N93- Solenoid valve 4 -N91- Solenoid valves 1/2 -N88/N89- Supply voltage terminal 15

G00387751

Fig. 84: Selectable Display Groups 005-008
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Indicated on display (example)			
Display zones: **1 2 3 4**	**Display group No.**	**Display zone**	**Designation**
Read measured value block 9 **00000000 00000000 P 00000000**	009	1 2 3 4	Brake pedal switch Idling speed/Kickdown switch Selector lever position Multi-function switch
Read measured value block 10 **73 C 1.0 V Normal 13.7 V**	010	1 2 3 4	ATF temperature Voltage at transmission fluid temperature sensor Transmission status Supply voltage
Read measured value block 11 **Bls. OFF SL 0 km/h P**	011	1 2 3 4	Brake light switch status Status of Shift Lock Solenoid -N110- Vehicle speed Selector lever position
Read measured value block 12 **manual Up key 4 100 %**	012	1 2 3 4	Selector lever position Tiptronic recognition Gear selected Transferable torque

G00387752

Fig. 85: Selectable Display Groups 009-012
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Indicated on display (example)			
Display zones: **1 2 3 4**	**Display group No.**	**Display zone**	**Designation**
Read measured value block 13 **D 00001001 00000000**	013	1 2 3 4	Selector lever position Multi-function switch Tiptronic recognition Status Tiptronic
Read measured value block 14 **0.0 % 00000001 00000000**	014	1 2 3 4	Accelerator pedal position Vacant Status idling switch Status accelerator pedal
Read measured value block 125 **Engine 1 ABS 1 Combi 1 Four wheel 0**	125	1 2 3 4	Communication engine control module Communication ABS control module Communication combi Communication four wheel control module

G00387753

Fig. 86: Selectable Display Groups 013, 014 & 125
Courtesy of VOLKSWAGEN UNITED STATES, INC.

NOTE: When the printer is switched on the actual display is printed out on a voucher.

If the specified values are reached in all the display field, press "right arrow" key. Indicated on display:

- Rapid data transfer HELP
- Select function XX

TEST TABLE

Display Group No.	Display zone	Designation	Test requirements	Specified readout on V.A.G 1551	Correction
001	1	Engine speed	when engine running	... rpm	- Perform electrical check. See ELECTRICAL CHECK - Check DTC table, DTC 17968. See DIAGNOSTIC TROUBLE CODE (DTC) TABLE

G00387754

Fig. 87: Test Table (Group 1, Zone 1)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Display Group No.	Display zone	Designation	Test requirements	Specified readout on V.A.G 1551	Correction
001	2	Sensor for transmission RPM -G182-	when driving and gear is selected [1)2)]	... rpm	- Perform electrical check, and check which elements are faulty/not active when driving. See ELECTRICAL CHECK
			R	approx. 0...10	
			1M	approx. 0...10	
			1 (trailer towing)	approx. 0...10	
			2	approx. 0...4000	
			3	approx. 0...8200	
			4	approx. 0...8200	
			5	approx. 0...8200	
Continuation			6	approx.	

[1)] When driving, a second technician is needed for reading the specified values.

[2)] The gear switching must be ended. Vehicle not in overrun mode (no descent or engine brake).

G00387755

Fig. 88: Test Table (Group 1, Zone 2)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Display Group No.	Display zone	Designation	Test requirements	Specified readout on V.A.G 1551	Correction
001	3	Sender for transmission output RPM - G195-	when driving and gear is selected [1)2)]	... rpm	- Perform electrical check, and check which elements are faulty/not active when driving. See ELECTRICAL CHECK
			R	approx. 0...2000	
			1M, 1	approx. 0...1200	
			2	approx. 0...4000	
			3	approx. 0...5800	
			4	approx. 0...8200	
			5	approx. 0...8200	
Continuation			6	approx.	

[1)] When driving, a second technician is needed for reading the specified values.

[2)] The gear switching must be ended. Vehicle not in overrun mode (no descent or engine brake).

G00387756

Fig. 89: Test Table (Group 1, Zone 3)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Display Group No.	Display zone	Designation	Test requirements		Specified readout on V.A.G 1551	Correction
001	4	Gear selected	Driving[1)]	Selector lever position		- Check solenoid valves. Display group numbers 007 and 008
				S	S	- Perform electrical check. See ELECTRICAL CHECK
				N	N	- Check selector lever position. Display group number 004
				R	R	
				D	D	
				6	1...6	
				5	1...5	
				4	1...4	
				3	1...3	
				2	2	
				1	1M	

[1)] When driving, a second technician is needed for reading the specified values.

G00387757

Fig. 90: Test Table (Group 1, Zone 4)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Display Group No.	Display zone	Designation	Test requirements	Specified readout on V.A.G 1551	Correction
002	1	Sensor for transmission RPM -G182-	when driving and gear is selected[1)2)]	... rpm	- Perform electrical check. See ELECTRICAL CHECK
			R	approx. 0...10	- Check which elements are faulty/not active
			1M	approx. 0...10	
			1 (trailer towing)	approx. 0...10	
			2	approx. 0...4000	
			3	approx. 0...8200	
			4	approx. 0...8200	
			5	approx. 0...8200	
			6	approx. 0...8200	
	2	Voltage at -G195-	Driving	0...5.15 V	- Perform electrical check. See ELECTRICAL CHECK

[1)] When driving, a second technician is needed for reading the specified values.

[2)] The gear switching must be ended. Vehicle not in overrun mode (no descent or engine brake).

G00387758

Fig. 91: Test Table (Group 2, Zones 1 & 2)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Display Group No.	Display zone	Designation	Test requirements	Specified readout on V.A.G 1551	Correction
002	3	Transmission output speed - G195-	when driving and gear is selected [1)2)]	... rpm	- Perform electrical check. See ELECTRICAL CHECK
			R	approx. 0...2000	- Check which elements are faulty/not active
			1M, 1	approx. 0...1200	
			2	approx. 0...4000	
			3	approx. 0...5800	
			4	approx. 0...8200	
			5	approx. 0...8200	
			6	approx. 0...8200	
	4	Voltage at -G195-		0...5.15 V	- Perform electrical check. See ELECTRICAL CHECK

[1)] When driving, a second technician is needed for reading the specified values.

[2)] The gear switching must be ended. Vehicle not in overrun mode (no descent or engine brake).

G00387759

Fig. 92: Test Table (Group 2, Zones 3 & 4)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Display Group No.	Display zone	Designation	Test requirements	Specified readout on V.A.G 1551	Correction
003	1	actual program	Driving[1)]		Is determined by driving style and road conditions (acceleration, accelerator pedal movement, velocity and load)
			Dynamic shift program is activated	DS	Avoid gear selection
			Warm-up program is activated	WL	In order to avoid high engine speeds upshift is faster
			Traction control system activated	AS	- Check display group number 004
Continuation			Tiptronic recognition activated	TT	- See DTCs 17089 and 17090. See DIAGNOSTIC TROUBLE CODE

[1)] When driving, a second technician is needed for reading the specified values.

G00387760

Fig. 93: Test Table (Group 3, Zone 1)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Display Group No.	Display zone	Designation	Test requirements		Specified readout on V.A.G 1551	Correction
003	2	Accelerator pedal position	Stationary	Idling	0...1 %	When accelerating from idling to wide open throttle, % figure constantly increases.
				Wide open throttle	99...100 %	- Perform electrical check. See ELECTRICAL CHECK
	3	Vehicle speed	Vehicle speed when driving[1)]		...km/h	Speedometer reading and readout on V.A.G 1551 may differ slightly.
	4	Gear selected	See display group number 001, display zone 4			

[1)] When driving, a second technician is needed for reading the specified values.

G00387761

Fig. 94: Test Table (Group 3, Zones 2, 3 & 4)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Display Group No.	Display zone	Designation	Test requirements		Specified readout on V.A.G 1551	Correction
004	1	Selector lever position - Multi-function TR switch -F125-	Stationary	P	P	- Check Multi-function TR switch -F125-. Display group number 004
			Selector lever in	R	R	- Perform electrical check. See ELECTRICAL CHECK
				N	N	- Check matching with display in instrument cluster
				D	D	- Adjust selector lever cable if necessary
				Tiptronic	Manual	See SERVICING – A/T (09G) article
Continuation				S	S	

G00387762

Fig. 95: Test Table (Group 4, Zone 1)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Display Group No.	Display zone	Designation	Test requirements		Specified readout on V.A.G 1551	Correction
004	2	Accelerator pedal position	Stationary	Idling	0...1 %	When accelerating from idling to wide open throttle, % figure constantly increases.
				Wide open throttle	99...100 %	- Perform electrical check. See ELECTRICAL CHECK
	3	Gradients	Driving without load, e.g. on a flat ground		Flat ground	Can be disregarded
			Driving with load, e.g. driving uphill		UP	
			Driving in overrun, e.g. driving downhill		DW	
	4	Gear selected	See display group number 001, display zone 4			

G00387763

Fig. 96: Test Table (Group 4, Zones 2, 3 & 4)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Display Group No.	Display zone	Designation	Test requirements		Specified readout on V.A.G 1551	Correction
005	1	Hill factor	Driving	driving uphill	... 30 %	Can be disregarded
				driving on a flat ground	0 %	
				driving downhill	...-30 %	
	2	Throttle valve value	Stationary	Idling	0...1 %	When accelerating from idling to wide open throttle, % figure constantly increases.
				Wide open throttle	99...100 %	- Perform electrical check. See ELECTRICAL CHECK
	3	Dynamic code	Calculated from running resistance index and the driver's evaluation		0...100 %	Can be disregarded
	4	Accelerator pedal position	Stationary	Idling	0...1 %	When accelerating from idling to wide open throttle, % figure constantly increases.
				Wide open throttle	99...100 %	- Perform electrical check. See ELECTRICAL CHECK

G00387764

Fig. 97: Test Table (Group 5, Zones 1-4)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Display Group No.	Display zone	Designation	Test requirements		Specified readout on V.A.G 1551	Correction
006	1	ATF temperature	Stationary with engine running		... C	
					-50 C	Short to Ground - Perform electrical check. See ELECTRICAL CHECK
					180 C	Short to positive or open circuit - Perform electrical check. See ELECTRICAL CHECK
	2	Specified current of Solenoid valve 4 -N91-	Driving[1)]	min.	0.0 A	- Refer to DTC table, DTC 00264 and 17132 See DIAGNOSTIC TROUBLE CODE (DTC) TABLE.
				max.	2.0 A	- Perform electrical check. See ELECTRICAL CHECK
	3	Torque converter lock-up clutch	Driving[1)]	Open	0	- Perform electrical check. See ELECTRICAL CHECK
				Closed	1	
Continuation				slip	2	

[1)] When driving, a second technician is needed for reading the specified values.

G00387765

Fig. 98: Test Table (Group 6, Zones 1, 2 & 3)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Display Group No.	Display zone	Designation	Test requirements		Specified readout on V.A.G 1551	Correction
006	4	Converter slip speed	Driving[1)]	Converter clutch open	0 ... Standstill brake speed	- Check ATF level: See SERVICING – A/T (09G) article.
				Converter clutch rule (last switching min. 20 seconds ago)	20...120 rpm	- Check which element is faulty or not active: See SERVICING – A/T (09G) article.
				Converter clutch closed	0...20 rpm	- Check ratio between engine, transmission input and transmission speed; Display

[1)] When driving, a second technician is needed for reading the specified values.

G00387766

Fig. 99: Test Table (Group 6, Zone 4)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Display Group No.	Display zone	Designation	Test requirements		Specified readout on V.A.G 1551	Correction
007	1	Specified current of Solenoid valve 5 -N92-	Driving[1)]	min.	0.0 A	- Refer to DTC table, DTC 00266. See DIAGNOSTIC TROUBLE CODE (DTC) TABLE
				max.	2.0 A	- Perform electrical check. See ELECTRICAL CHECK
	2	Specified current of Solenoid valve 9 -N282-	Driving[1)]	min.	0.0 A	- Refer to DTC table, DTC 00348. See DIAGNOSTIC TROUBLE CODE (DTC) TABLE
Continuation				max.	2.0 A	- Perform electrical check. See ELECTRICAL CHECK

[1)] When driving, a second technician is needed for reading the specified values.

G00387767

Fig. 100: Test Table (Group 7, Zones 1 & 2)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Display Group No.	Display zone	Designation	Test requirements		Specified readout on V.A.G 1551	Correction
007	3	Specified current of Solenoid valve 3 -N90-	Driving[1)]	min.	0.0 A	- Refer to DTC table, DTCs 00262 and 19155 to 19157. See DIAGNOSTIC TROUBLE CODE (DTC)
				max.	2.0 A	- Perform electrical check. See ELECTRICAL CHECK
	4	Specified current of Solenoid valve 10 -N283-	Driving[1)]	min.	0.0 A	- Refer to DTC table, DTCs 00349 and 19164 to 19166. See DIAGNOSTIC TROUBLE CODE (DTC)
				max.	2.0 A	- Perform electrical check. See ELECTRICAL CHECK

[1)] When driving, a second technician is needed for reading the specified values.

G00387768

Fig. 101: Test Table (Group 7, Zones 3 & 4)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Display Group No.	Display zone	Designation	Test requirements		Specified readout on V.A.G 1551	Correction
008	1	Specified current of Solenoid valve 6 -N93-	Driving[1)]	min.	0.0 A	- Refer to DTC table, DTCs 00268 and 17182. See DIAGNOSTIC TROUBLE CODE
				max.	2.0 A	- Perform electrical check. See ELECTRICAL CHECK
	2	Specified current of Solenoid valve 4 -N91-	Driving[1)]	min.	0.0 A	- Refer to DTC table, DTCs 00264 and 17132. See DIAGNOSTIC TROUBLE CODE
Continuation				max.	2.0 A	- Perform electrical check. See ELECTRICAL CHECK

[1)] When driving, a second technician is needed for reading the specified values.

G00387769

Fig. 102: Test Table (Group 8, Zones 1 & 2)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Display Group No.	Display zone	Designation	Test requirements		Specified readout on V.A.G 1551	Correction
008	3	Solenoid valves -N88- and -N89-	Driving[1)]	Solenoid valve -N88- open	00000001	- Perform electrical check. See ELECTRICAL CHECK
				Solenoid valve -N89- open	00000010	
	4	Supply voltage terminal 15	Stationary	min.	10.0 V	- Refer to DTC table, DTC 00364. See DIAGNOSTIC TROUBLE CODE
				max.	16.0 V	- Perform electrical check. See ELECTRICAL CHECK

[1)] When driving, a second technician is needed for reading the specified values.

G00387770

Fig. 103: Test Table (Group 8, Zones 3 & 4)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Display Group No.	Display zone	Designation	Test requirements		Specified readout on V.A.G 1551	Correction
009	1	Brake pedal switch	Stationary	Brakes operated	00000011	- Perform electrical check. See ELECTRICAL CHECK
				Brakes not operated	00000000	- Check brake
	2	Idling speed/Kickdown switch	Stationary	Idling	00000010	- Perform electrical check. See ELECTRICAL CHECK
				Depress accelerator pedal fully	00000001	- Check TP sensor:

G00387771

Fig. 104: Test Table (Group 9, Zones 1 & 2)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Display Group No.	Display zone	Designation	Test requirements		Specified readout on V.A.G 1551	Correction
009	3	Selector lever position	See display group number 004, display zone 1			
	4	Multi-function TR switch -F125-	Stationary	Selector lever position		- Check multi-function TR switch -F125-.
				P	00000110	- Perform electrical check. See ELECTRICAL CHECK
				R	00000011	
				N	00001010	
				D	00001001	
				S	00000000	

G00387772

Fig. 105: Test Table (Group 9, Zones 3 & 4)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Display Group No.	Display zone	Designation	Test requirements		Specified readout on V.A.G 1551	Correction
010	1	ATF temperature	See display group number 006, display zone 1			
	2	Voltage at transmission fluid temperature sensor	Stationary with engine running. When temperature sensor is faulty a replacement value is displayed.		0...5 V	- Check Transmission fluid temperature sensor -G93-. See ELECTRICAL CHECK
	3	Transmission status		warm-up program	WL	- Perform electrical. See ELECTRICAL CHECK
				Normal operation	Normal	
				Emergency mode	Error	
	4	Supply voltage terminal 30	Stationary	min.	10.0 V	- Perform electrical check. See ELECTRICAL CHECK
				max.	16.0 V	- Refer to DTC table, DTC 18010. See DIAGNOSTIC TROUBLE CODE

G00387773

Fig. 106: Test Table (Group 10, Zones 1-4)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Display Group No.	Display zone	Designation	Test requirements	Specified readout on V.A.G 1551	Correction
011	1	Brake light switch status	not operated	Bls. OFF	- Perform electrical check. See ELECTRICAL CHECK
			operated	Bls. ON	
	2	Status Shift lock solenoid -N110-	active	SL	- Perform electrical check. See ELECTRICAL CHECK
			not active	- -	
	3	Vehicle speed	Vehicle speed when driving[1)]	...km/h	Speedometer reading and readout on V.A.G 1551 may differ slightly.
	4	Selector lever	See display group number 004, display zone 1		

G00387774

Fig. 107: Test Table (Group 11, Zones 1-4)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Display Group No.	Display zone	Designation	Test requirements		Specified readout on V.A.G 1551	Correction
012	1	Selector lever position	See display group number 004, display zone 1			
	2	Tiptronic recognition	Selector lever in	Tiptronic gap	manual	- Perform electrical check. See ELECTRICAL CHECK
				Upshift	Up key	
				Backshift	Back key	
	3	Gear selected	See display group number 004, display zone 4			
	4	Torque	Stationary		... %	Can be disregarded

G00387775

Fig. 108: Test Table (Group 12, Zones 1-4)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Display Group No.	Display zone	Designation	Test requirements		Specified readout on V.A.G 1551	Correction
013	1	Selector lever position	See display group number 004, display zone 1			
	2	Multi-function TR switch -F125-	Stationary	Selector lever position		- Check Multi-function TR switch -F125-.
				P	00000110	- Perform electrical check. See ELECTRICAL CHECK
				R	00000011	
				N	00001010	
				D	00001001	
				S	00000000	
	3	Tiptronic recognition	Selector lever in	Tiptronic gap	manual	- Perform electrical check from. See ELECTRICAL CHECK
				Upshift	Up key	
Continuation				Backshift	Back key	

G00387776

Fig. 109: Test Table (Group 13, Zones 1, 2 & 3)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Display Group No.	Display zone	Designation	Test requirements		Specified readout on V.A.G 1551	Correction
013	4	Status Tiptronic	Stationary Selector lever in	Tiptronic gap	00001000	- Perform electrical check. See ELECTRICAL CHECK
				Upshift	00010000	
				Backshift	00000010	

G00387777

Fig. 110: Test Table (Group 13, Zone 4)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Display Group No.	Display zone	Designation	Test requirements		Specified readout on V.A.G 1551	Correction
014	1	Accelerator pedal position	Stationary	Idling	0...1 %	When accelerating from idling to wide open throttle, % figure constantly increases.
				Wide open throttle	99...100 %	- Perform electrical check. See ELECTRICAL CHECK
	3	Idling switch status (signal via data bus)	Stationary	Idling	00000001	- Perform electrical check. See ELECTRICAL CHECK
				Rev up	00000000	
	4	Accelerator pedal status (signal via data bus)	Stationary	Accelerator pedal not depressed	00000000	- Perform electrical check. See ELECTRICAL CHECK
				Accelerator pedal	00000001	

G00387778

Fig. 111: Test Table (Group 14, Zones 1, 3 & 4)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Display Group No.	Display zone	Designation	Test requirements	Specified readout on V.A.G 1551	Correction
125	1	Communication engine control module	Equipped with Data bus	Engine 1	- Perform electrical check. See ELECTRICAL CHECK
			Not equipped with Data bus	Engine 0	
	2	Communication ABS control module	Equipped with Data bus	ABS 1	- Perform electrical check. See ELECTRICAL CHECK
			Not equipped with Data bus	ABS 0	
	3	Communication combi	Equipped with Data bus	Combi 1	- Perform electrical check. See ELECTRICAL CHECK
			Not equipped	Combi 0	

G00387779

Fig. 112: Test Table (Group 125, Zones 1, 2 & 3)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

ELECTRICAL CHECK

SPECIAL TOOLS AND EQUIPMENT

- V.A.G 1526 A or Fluke 83 multimeter or equivalent
- V.A.G 1594 A Adapter set
- V.A.G 1598/14 Test box (basic equipment)
- V.A.G 1598/47 Test box

SUPPLEMENTARY INFORMATION

- **SERVICING - A/T (09G)** article
- Electrical Wiring Diagrams

CHECK REQUIREMENTS

- Battery voltage OK
- Fuses OK
- Ground connections OK

NOTES

- The socket assignments of test box V.A.G 1598/47 are identical to Transmission Control Module (TCM) -J217- contact assignment in the wiring diagram.
- The specified values are valid for an ambient temperature from 0° C to 40° C.
- If the readings obtained differ from the specified values, determine fault according to wiring diagram.
- If the readings obtained differ only slightly from the specified values, clean the sockets and connectors of the testers and test leads and repeat the test. Before replacing the particular components, test the wiring and connections and, particularly if specified values are below 10 ohms, repeat resistance measurements on the component.

TCM -J217- MULTI-PIN CONNECTOR (52 PIN) ASSIGNMENT (SOCKETS ON V.A.G 1598/47)

1- Ground (terminal 31)	23- Vacant
2- Ground (terminal 31)	24- Sender -2- for hydraulic pressure -G195-
3- Supply voltage (terminal 30)	25- Sender -1- for hydraulic pressure -G182-
4- Solenoid valve 10 -N283-	26- Vacant
5- Solenoid valve 4 -N91-	27- Supply voltage (terminal 15)
6- Solenoid valve 5 -N92-	28- Supply voltage (terminal 15)
7- Vacant	29- Shift lock solenoid -N110-
8- Transmission fluid temperature sensor - G93- (ATF)	30- Solenoid valve 3 -N90-
9- Diagnosis K-wire	31- Solenoid valve 6 -N93-
10- Multi-function TR switch -F125- (Pin 7)	32- Solenoid valve 9 -N282-
11- Tiptronic switch -F189- (Pin 4)	33- Vacant
12- Vacant	34- Drive train data bus low
13- Vacant	35- Vacant
14- Vacant	36- Multi-function TR switch -F125- (Pin 9)
15- Solenoid valve 2 -N89-	37- Tiptronic switch -F189- (Pin 5)
16- Solenoid valve 9 -N282-	38- Sender for transmission output RPM -G195-
17- Solenoid valve 6 -N93-	39- Sensor for transmission RPM -G182-
18- Solenoid valve 3 -N90-	40- Vacant
19- Vacant	41- Solenoid valve 1 -N88-
20- Vacant	42- Solenoid valve 5 -N92-
21- Multi-function TR switch -F125- (Pin 8)	43- Solenoid valve 4 -N91-
22- Multi-function TR switch -F125- (Pin 5)	44- Solenoid valve 10 -N283-

G00387780

Fig. 113: TCM Multi-Pin Connector (52 Pin) Assignment (1 Of 2)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

45- Transmission fluid temperature sensor - G93- (ATF)	49- Vacant
46- Drive train data bus high	50- Sender for transmission output RPM -G195-
47- Multi-function TR switch -F125- (Pin 1)	51- Sensor for transmission RPM -G182-
48- Tiptronic switch -F189- (Pin 3)	52- Vehicle speed signal (output)

G00387781

Fig. 114: TCM Multi-Pin Connector (52 Pin) Assignment (2 Of 2)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

LIST OF TEST STEPS (MULTI-PIN CONNECTOR, 52 PIN)

Only perform test steps for the relevant component as listed in DTC table and measured value block.

Component checked		Component checked	
Supply voltage from Transmission Control Module (TCM) -J217-	- Perform test step 1	Solenoid valve 6 -N93-	- Perform test step 11
Shift lock solenoid (magnet) -N110-	- Perform test step 2 and 14	Solenoid valve 9 -N282-	- Perform test step 12
Multi-function TR switch - F125-	- Perform test step 3 and 5	Solenoid valve 10 - N283-	- Perform test step 13
Ground connection for TCM -J217-	- Perform test step 4	Sensor for transmission RPM -G182-	- Perform test step 15
Solenoid valve 1 -N88-	- Perform test step 6	Sender for transmission output RPM -G195-	- Perform test step 16
Solenoid valve 2 -N89-	- Perform test step 7	Transmission fluid temperature sensor - G93- (ATF)	- Perform test step 17
Solenoid valve 3 -N90-	- Perform test step 8	Sender -1- for hydraulic pressure -G193-	- Perform test step 18
Solenoid valve 4 -N91-	- Perform test step 9	Sender -1- for hydraulic pressure -G193-	- Perform test step 19
Solenoid valve 5 -N92-	- Perform test step 10	Tiptronic switch -F189-	- Perform test step 20

G00387782

Fig. 115: List Of Test Steps (Multi-Pin Connector, 52 Pin)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

TEST TABLE

Switch to voltage measuring range 20 V					
Test step	**V.A.G 1598/47**	**Item tested**	• Test requirements - Additional operations	**Specified value**	**Measures for deviations from Specified value**
1	27 + 1 27 + 2 28 + 1 28 + 2	Supply voltage Transmission Control Module -J217- Terminal 15	• Ignition switched on	Approx. battery voltage	- Check wiring according to wiring diagram: - Check wire from contact 1 and 2 to Ground - Check wire from contacts 27 and 28 to terminal 15
	3 + 1 3 + 2	Supply voltage Transmission Control Module -J217- Terminal 30	• Ignition switched off	Approx. battery voltage	- Check wiring according to wiring diagram: - Check wire from contact 1 and 2 to Ground - Check wire from contact 3 to terminal 30
2	29 + 1	Shift lock solenoid -N110-	• Ignition switched on	Approx. battery voltage	- Check wiring according to wiring diagram. See test step 10

G00387783

Fig. 116: Test Table (Steps 1 & 2)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Switch to voltage measuring range 20 V					
Test step	**V.A.G 1598/47**	**Item tested**	• Test requirements - Additional operations	**Specified value**	**Measures for deviations from Specified value**
3	10 + 1	Multi-function TR switch -F125-	• Ignition switched on - Selector lever in position P	0 V	- Check wiring according to wiring diagram
			- Selector lever in R, N, S or D position	Approx. battery voltage	- Check supply voltage of Multi-function TR switch -F125-
	21 + 1		• Ignition switched on - Selector lever in R position	Approx. battery voltage	- Check connector on Multi-function TR switch -F125-
	22 + 1		• Ignition switched on - Selector lever in position R or D	0 V	- Replace Multi-function TR switch -F125-:
			- Selector lever in position P, N or S	Approx. battery voltage	See SERVICING – A/T (09G) article
	36 + 1		• Ignition switched on - Selector lever in D or S position	Approx. battery voltage	
			- Selector lever in position P, R or N	0 V	
	47 + 1		• Ignition switched on - Selector lever in N or D position	0 V	
			- Selector lever in position P, R or S	Approx. battery voltage	

G00387784

Fig. 117: Test Table (Step 3)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Switch to resistance measuring range 200					
Test step	**V.A.G 1598/47**	**Item tested**	Test requirements - Additional	**Specified value**	**Measures for deviations from Specified value**
4	1 + Ground battery	Ground connections of Transmission Control Module -J217-	Ignition switched off	less than 1 Ω	- Check wiring according to wiring diagram:
	2 + Ground			less than 1 Ω	

G00387785

Fig. 118: Test Table (Step 4)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Switch to resistance measuring range 200					
Test step	**V.A.G 1598/47**	**Item tested**	• Test requirements - Additional operations	**Specified value**	**Measures for deviations from Specified value**
5	10 + 1	Multi-function TR switch - F125-	• Ignition switched off - Selector lever in position P	infinite Ω 1)	- Check wiring according to wiring diagram: - Check connector on Multi-function TR switch -F125- - Replace Multi-function TR switch -F125-: See SERVICING – A/T (09G) article
			- Selector lever in R, N, S or D position	less than 1 Ω	
	22 + 1		• Ignition switched off - Selector lever in position R or D	infinite Ω 1)	
			- Selector lever in position P, N or S	less than 1 Ω	
	36 + 1		• Ignition switched off - Selector lever in position P, R or N	infinite Ω 1)	
			- Selector lever in D or S position	less than 1 Ω	
	47 + 1		• Ignition switched off - Selector lever in N or D position	infinite Ω 1)	
			- Selector lever in position P, R or S	less than 1 Ω	

1) Switch V.A.G 1526 to highest Ω setting

G00387786

Fig. 119: Test Table (Step 5)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Switch to resistance measuring range 200					
Test step	**V.A.G 1598/47**	**Item tested**	• Test requirements - Additional	**Specified value**	**Measures for deviations from specified value**
6	41 + 1	Solenoid valve 1 -N88-	• Ignition switched off	11 up to 15 Ω	- Check wiring according to wiring - Replace wiring harness in transmission or valve body: See SERVICING – A/T (09G) article
7	15 + 1	Solenoid valve 2 -N89-	• Ignition switched off	11 up to 15 Ω	
8	18 + 30	Solenoid valve 3 -N90-	• Ignition switched off	5.0 up to 5.6 Ω	
9	5 + 43	Solenoid valve 4 -N91-	• Ignition switched off	5.0 up to 5.6 Ω	
10	6 + 42	Solenoid valve 5 -N92-	• Ignition switched off	5.0 up to 5.6 Ω	
11	17 + 31	Solenoid valve 6 -N93-	• Ignition switched off	5.0 up to 5.6 Ω	
12	16 + 32	Solenoid valve 9 -N282-	• Ignition switched off	5.0 up to 5.6 Ω	
13	16 + 32	Solenoid valve 10 - N282-	• Ignition switched off	5.0 up to 5.6 Ω	

G00387787

Fig. 120: Test Table (Steps 6-13)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Switch to resistance measuring range 200					
Test step	**V.A.G 1598/47**	**Item tested**	• Test requirements	**Specified value**	**Measures for deviations from Specified value**
14	29 + 1	Shift lock solenoid -N110-	• Ignition switched off - Selector lever in "P"	20 up to 23 Ω	- Check wiring according to wiring diagram: - Replace Shift lock solenoid -N110-: See SERVICING – A/T (09G) article

G00387788

Fig. 121: Test Table (Step 14)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Switch to resistance measuring range 2 M					
Test step	**V.A.G 1598/47**	**Item tested**	• Test requirements - Additional	**Specified value**	**Measures for deviations from specified value**
15	39 + 51 39 + 1 51 + 1	Sensor for transmission RPM -G182-[2)]	• Ignition switched off	infinite Ω 1)	- Check wiring according to wiring diagram: - Replace wiring harness in valve body - Replace Sensor for transmission RPM - G182-: See SERVICING – A/T (09G) article
16	38 + 50 38 + 1 50 + 1	Sender for transmission output RPM -G195-	• Ignition switched off	infinite Ω 1)	- Check wiring according to wiring diagram: - Replace wiring harness in valve body - Replace Sender for transmission output RPM -G195-: See SERVICING – A/T (09G) article

[1)] Switch V.A.G 1526 to highest Ω setting

G00387789

Fig. 122: Test Table (Steps 15 & 16)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Switch to resistance measuring range 20 k					
Test step	**V.A.G 1598/47**	**Item tested**	• Test requirements - Additional	**Specified value**	**Measures for deviations from specified value**
17	8 + 45	Transmission fluid temperature sensor -G93- (ATF)	• Ignition switched off • ATF Approx. 10° C Approx. 25° C Approx. 110° C	 Approx. 6.4 k Ω 2) Approx. 3.5 k Ω 2) Approx.0.25 k Ω 2)	- Check wiring according to wiring diagram: - Replace wiring harness in valve body: See SERVICING – A/T (09G) article
	8 + 1 8 + 3 45 + 1		• Ignition switched off	infinite Ω 1)	

1) Switch V.A.G 1526 to highest Ω setting

2) Permissible tolerance: ± 0.1 K Ω

G00387790

Fig. 123: Test Table (Step 17)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Switch to resistance measuring range 2 M					
Test step	**V.A.G 1598/47**	**Item tested**	• Test requirements - Additional	**Specified value**	**Measures for deviations from specified value**
18	25 + 1 25 + 3	Sender -1- for hydraulic pressure -G193-	• Ignition switched off	infinite Ω 1)	- Check wiring according to wiring diagram: - Replace wiring harness in valve body - Replace Sender -1- for hydraulic pressure -G193-: See SERVICING – A/T (09G) article
19	24 + 1 24 + 3	Sender -2- for hydraulic pressure -G194-	• Ignition switched off	infinite Ω 1)	- Check wiring according to wiring diagram: - Replace wiring harness in valve body - Replace Sender -2- for hydraulic pressure -G194-: See SERVICING – A/T (09G) article

1) Switch V.A.G 1526 to highest Ω setting

G00387791

Fig. 124: Test Table (Steps 18 & 19)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Switch to resistance measuring range 2 M					
Test step	**V.A.G 1598/47**	**Item tested**	• Test requirements - Additional operations	**Specified value**	**Measures for deviations from specified value**
20	48 + 1	Tiptronic switch -F189-	• Ignition switched off - Selector lever in Tiptronic gate	0 Ω	- Check wiring according to wiring diagram:
			- Selector lever in D	infinite Ω 1)	- Replace Tiptronic switch -F189-: See SERVICING - A/T (09G) article
	11 + 1		• Ignition switched off - Selector lever in Tiptronic gate	0 Ω	
			- Selector lever in D	infinite Ω 1)	
	37 + 1		• Ignition switched off - Selector lever in Tiptronic gate	0 Ω	
			- Selector lever in D	infinite Ω 1)	

G00387792

Fig. 125: Test Table (Step 20)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

DEFINITIONS

NOTE: **These explanations refer only to this assembly group: 6-speed automatic transmission 09G. These definitions are not necessarily valid generally.**

ABS

Anti-locking brake system.

ATF (AUTOMATIC TRANSMISSION FLUID)

Transmission oil for automatic transmission

ATF LEVEL

Level of ATF in transmission when full. See **SERVICING - A/T (09G)** article.

AUTOMATIC TRANSMISSION 09G

A further development of the dynamic shift program and is equipped with planetary gear set and Ravigneaux planetary gearbox.

DATA BUS LOW (HIGH)

The voltage used to transport data is low (high). Further information concerning this subject can be found in Self-study program "CAN-BUS Operation".

TORQUE CONVERTER

Transfers the engine torque to the automatic transmission and acts as an hydraulic drive-away clutch. The torque converter also contains the lock-up clutch.

DSP (DYNAMIC SHIFT PROGRAM)

Further information concerning this subject can be found in Self-study program No. 180

HILL CLIMBING PROGRAM

The hill program is an item of software in the control module which influences the shift points when the vehicle is being driven up hill.

SHORT TO GROUND

Current flows incorrectly to a live component without supplying a consumer.

ON BOARD DIAGNOSTIC (OBD) OR SELF-DIAGNOSIS

The capability of the control module:

- to detect faults
- to react to faults

- to store faults
- to register faults and make them available to the measured value block

"RIGHT ARROW" BUTTON

Entry zone on screen of VAS 5051, also known as the "Advance" button.

Further information concerning this subject can be found in Self-study program No. 202.

PERFORMING ELECTRICAL CHECK

A targeted check of the electronic components by certain measurements.

PERFORMING VEHICLE OBD OR SELF-DIAGNOSIS

Connecting the Vehicle Diagnosis, Test and Information System VAS 5051 to, among other things, read Diagnostic Trouble Code (DTC) memories, perform default settings or the read measured value blocks.

VEHICLE DIAGNOSIS, TESTING AND INFORMATION SYSTEM VAS 5051

The operating modes "Vehicle self-diagnosis", "Measurement technology" and "Guided fault finding" offer the most complete of current technical information.

It replaces and expands all functions that were previously possible with the V.A.G 1551 Scan Tool or Vehicle test system V.A.G 1552.

Further information concerning this subject can be found in Self-study program No. 202.

SENDER FOR TRANSMISSION OUTPUT RPM -G195-

The sensor records the speed of the output gear and transmits it to the automatic transmission control module.

SENSOR FOR TRANSMISSION RPM -G182-

The sensor records the speed of the planetary carrier in the Ravigneaux planetary gear set and transmits it to the automatic transmission control module.

TRANSMISSION FLUID TEMPERATURE SENSOR -G93-

Monitors the temperature of the ATF to ensure the transmission does not overheat. It is located on valve body in the wiring harness to the sensors.

GUIDED FAULT FINDING

An operating mode of the Vehicle Diagnosis, Testing and Information System VAS 5051.

INITIATE BASIC SETTING

Learned values in a control module are reset to factory (default) settings.

INITIALIZATION

A predetermined setting activated by a predetermined program sequence.

CLUTCHES

Together with the brakes, they engage the individual gears.

SHIFT LOCK SOLENOID -N110-

Located in the selector mechanism close to the selector lever. Prevents involuntary movement of the selector lever out of positions "P" and "N" as long as the brake pedal is not depressed.

SOLENOID VALVES OR PRESSURE CONTROL VALVES

A solenoid valve opens or closes an oil channel to a clutch or brake.

A pressure control valve regulates the ATF pressure to a clutch or brake.

MULTI-FUNCTION TRANSMISSION RANGE (TR) SWITCH -F125-

Electrical switch with various functions.

EMERGENCY RUNNING

When a sensor fails the control module selects a replacement signal and introduces replacement functions. If this is possible an emergency mode will be initiated.

The emergency running mode is a "Condition of the control module", which ensure faults detected by the control module will not affect continued driving safety. It protects the transmission from damage while impairing the driving characteristics only as much as necessary.

PARKING LOCK

The selector lever locks the parking lock wheel when the vehicle is stationary and prevents the vehicle from rolling (involuntarily).

STARTING INTERLOCK RELAY -J207-

When selector lever is in position "R" the relay switch on the back-up lights. The required signal comes from the multi-function switch.

In selector lever positions "P" and "N" the relay allows the use of the starter motor.

VALVE BODY

Located on the bottom of the transmission and is enclosed in the ATF oil pan. Its valves regulate the hydraulic pressure and distributes it via the oil channels to switch elements (clutches and brakes)

AUTOMATIC TRANSMISSION CONTROL MODULE (TCM) -J217-

The electronic control module defines the shift points. The function of the transmission is monitored via On Board Diagnostic (OBD). If a component or sensor fails, an emergency running program is initiated to ensure the vehicle can still be driven.

TIPTRONIC

A supplementary selector gate to the right of the normal selector gate which when manually tipping the selector lever toward Up (+) will change up a gear, and when tipping to Down (-) will change down a gear.

TCC (TORQUE CONVERTER LOCK-UP CLUTCH)

It transfers the engine torque mechanically to the transmission.

SHIFT LOCK

Prevents involuntary movement of the selector lever out of positions "P" and "N" as long as the brake pedal is not depressed.

IGNITION KEY WITHDRAWAL LOCK

Ensures that the ignition key can only be withdrawn when park position is selected and in addition mechanically locks the selector lever in this position.